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ILLUSTRATIONS.

Business Premises, 82, Fleet-street ..... Mr. John Belcher, A.R.A., Architect.
Houghton Hall, Norfolk ..... Drawn by Mr. Stanley Towse.
Addition to "Hopedene," Surrey ..... Mr. P. N. Ginham, Architect.
Soup Kitchen for Jewish Poor, Butler-street, E. ..... Mr. Lewis Solomon, F.R.I.B.A., Architect.

Block in Text.

Houghton Hall, Norfolk: Profiles of Mouldings ..... Page 90

CONTENTS.

Students' Drawings at the Institute 79
Ordnance Survey Maps 81
Water Supply for "Domestic Purposes" 82
Notes 83
The Signs in Lombard-street 85
Surbiton Clock Tower Competition 86
Royal Institute of British Architects 86
Illustrations:—
Business Premises, Fleet-street 90
Houghton Hall, Norfolk 90
Addition to "Hopedene," Surrey 91
Soup Kitchen for the Jewish Poor 91
Drawings Sent without Names 91
Archæological Societies 91
Architectural Societies 91
Competitions 92
The Builder's Foremen's Association 92
The London County Council 92
Applications under the London Building Act, 1894 93
Trade Catalogues 94
Correspondence:—
Natural and Artificial Sewage Purification 94
Proposed Bridge at Cowes 94
Books Received 95
General Building News 95
Foreign 95
Miscellaneous 96
Capital and Labour 97
Legal:—
Building Dispute at Leicester 97
Builder's Action for Libel 98
Patents of the Week 98
Meetings 99
Some Recent Sales of Property 99
Prices Current of Materials 99
Tenders 100

Students' Drawings at the Institute.

THE designs sent in for the various prizes offered by the Institute of Architects, and now on view at the Alpine Club, are on the whole not quite up to the usual standard, though there are some fine drawings among them, and the competition for the Soane Medallion and for the Grissell Medal has been more numerous than usual: twenty-one competitors for the Soane, and eleven for the Grissell Medal. On the other hand the medal and prize for measured drawings, usually rather a popular one, has this year only attracted three competitors.

The subject given for the Soane Medallion was a very good one; a design for a town church as a corner site, with only two free frontages. This latter condition has been criticised as unnecessarily fettering the competitors; but inasmuch as it is a practical condition which must often exist in regard to the site of a city church, it was a reasonable and a useful one to make. In another respect the directions to competitors were not so happy. They were recommended to read Sir W. Emerson's remarks on church planning in a Presidential address delivered two or three years ago. These remarks, which were rather vague in their tendency, referred to the ancient position of the altar on the chord of the apse, and the position of the seats for the clergy in the rear of it and around the apse. This hint seems to have been interpreted by a number of the competitors into a recommendation to place the choir seats behind the altar, with results which, from a practical point of view, are perfectly absurd. In several of the plans we find not only an altar but a large baldacchino placed in front of the chancel, and the choir behind it, so that they could not properly be heard by the congregation or lead, when required, the congregational singing; one competitor has actually almost shut out the choir entirely from the church by a screen wall like the iconostasis of the Greek Church; and two or three others plan the choir so as practically to shut them out, and call this part of the church the "choir chapel," as if the choir were a separate body who had nothing to do with the congregation; but this is a very natural result from their attention having been directed to a misleading piece of advice. On the other hand, the present Council, or whoever set the programme, seem to have been entirely oblivious of the fact that some years ago a joint Committee of architects and musicians, formed under the auspices of the Institute, fully discussed the question of the position of choir and organ, and came to conclusions almost exactly the reverse of those which the competitors, rightly or wrongly, have extracted from the Presidential address in question. The opinion formulated by that Committee was that the "organ-chamber" was in any case an absolute mistake, ruinous to the effect of the instrument; and that the best position for the choir was on each side of the nave, so as to be near the congregation. That the proceedings and the conclusions of that important Committee should have been entirely ignored seems to show that the Council have very little knowledge of their own archives. If the competitors had been directed to consult the conclusions of the Committee, or if an outline of the said conclusions had been furnished to them, they would have had some good practical advice before them in regard to the arrangement of choir and organ, of which, as it is, none of them seem to know anything; and they would have been encouraged to try some experiments, which might have been of considerable interest, in adapting the plan and architectural design of the church to the suggestions above referred to.

The medal has been awarded to the design signed Ιχθυς, by Mr. E. F. Reynolds; and as far as evidence of architectural ability goes it has been rightly awarded. Whether a design so distinctly Byzantine, so exotic in appearance, is the most suitable for an English city church, is a question; but the style has been well studied, and the perspective drawing is a fine production, showing exceptional ability both of design and drawing. The plan shows a large open area, partly covered by a dome, and a semi-octagon apse with the choir seated round it, the altar in front, and clergy stalls immediately behind the altar. As there is no baldacchino, the choir are not quite so shut off as in some of the plans, but they are too far from the congregation for any practical purpose, and are occupying a position for which there is no precedent whatever. The organ, as in most of the plans, is boxed up in organ chambers, in this case still worse by being situated high aloft. The author might have done better in these respects if he had been directed to the proper source for advice on the subject.

The medal of merit has been adjudged to "Como" (Mr. F. C. Mears) for a peculiar but bold and striking design of Lombard type, showing a large area on plan with a dome over part of it, and a very shallow sacrarium in front of which the antiphonal choir occupy the more usual position, but with rather small space considering the size of the church. The organ is not cooped up as in most of the designs, though, as it does not appear on the ground plan (being high up), there is nothing to show what area is given to it, a point in regard to which most of the competitors—one may add, most architects—have very inadequate ideas. The main point in the design is that the dome is piled up into a kind of two-storied domed tower, rising high above the main roof line; a creditably bold architectural conception, and which would have a fine effect both externally and internally; though as far as architectural effect and treatment are concerned a medal of merit would seem as well earned by "New Era," also a design of somewhat Lombardic character, with twin towers in red brick which break out into picturesque stone lantern terminations of more Renaissance style, diversified with bronze figures of angels blowing trumpets. The plan shows a wide open area with a dome over it. The choir and organ are as badly placed as can be, but this objection applies equally to the prize design; and as a piece of architectural design and grouping the perspective view is very effective,

and perhaps on the whole superior to "Como."

Among the other designs are some which are highly creditable; others whose authors have suffered shipwreck in a quest after originality. One indeed, who in questionable French signs "Ne oubliez," seems to have cast a loving eye backward at the possibilities of Late Gothic detail; a neighbour, on the other hand, exhorts us to "Advance," but not we fear quite in the right direction. "E Naturâ Architectura" is a dangerous motto, and only true in a metaphysical sense; but in this design the treatment of the ceiling in bands or successions of panels painted with figures and decorative trees, rising off plain square piers, is clever and effective. "Xerxes" is worth a word for its extremity of ugliness and bad taste in the exterior design; the author had better give up architecture. A comparison of this with the perspective of the prize set tempts one to an application of an old nursery rhyme to students' designs:—

> "When they are good, they are very very good;
> But when they are bad they are *horrid*."

"X" shows a nice series of pencil drawings of very imitative Gothic based on Pearson's work; "X*b*" a very clever set reminiscent of Sedding; the drawings are admirably executed and contain a good deal of cleverly designed detail. "Lauda Finem" is a meritorious Late Renaissance design, displaying a good deal of vigour and freedom, though some of the details are rather crudely drawn, *e.g.*, the bases of the columns at the east end. The position of the choir, in a "choir chapel" behind a baldacchino, and of the organ, cornered in a kind of loft, are both as bad as they can be; but the exterior architectural treatment deserves recognition. "Neni" is another Late Renaissance design with the same kind of merit. "Sanctus" is a very severe quasi-Byzantine design, with a dome over the eastern portion of the area; the elevations and perspective are very beautifully drawn in pencil, and the design generally, which depends entirely on line and mass and not on ornament, has decided merit: the author shows also a practical arrangement of the choir in seats arranged in a segment of a circle in front of, not behind the altar, and facing the congregation; a position suitable at all events in an acoustic, if not in a ritual sense.

The subject for the Tite Prize was "A Pavilion in a Public Garden," a very good subject for a prize which is for Italian architecture, since this type of architecture never looks better than in combination with a park or garden. Some details as to the practical accommodation required were added, but in a case of this kind the architectural treatment is almost everything. The prize has been awarded to the design by Mr. David Smith, a choice which the Committee cannot have found it difficult to arrive at, as there is no other which has any pretence to compete with it. The Tite designs are not as good as usual this year, and one reason is that most of the competitors have been too ambitious, and have forgotten what is the real nature of a garden pavilion, and that it is not a thing to be treated with a great dome, like a town hall or cathedral. Now this is where Mr. Smith has been exactly right; he has given us a low-proportioned Classic building, which could hardly be taken for anything else than what it is; there is a wide internal hall and exterior loggias; the angles are accentuated by pavilions which are internally octagonal and treated as receptacles for sculpture—they are hardly to be called "sculpture galleries," as they only provide for sculpture in four niches on the alternate sides. A point not to be passed over is that the retiring-rooms for men and women are very well placed and arranged in regard to separation and privacy of access; a point often entirely overlooked (as in "Le Nord" where the men's and women's rooms face each other at opposite sides of a central hall, and in "Archivolt," where—still worse—the two doors are side by side). The main entrance does not seem quite sufficiently emphasised, and the provision of an apse with solid stone walls as the exterior bandstand is not satisfactory, as the players at the back would hardly be much heard. But in the main this is an admirable design for the purpose described, and has little of the immaturity of a student's work about it; it would do credit to any architect. The only other among the other designs that is worth special mention is "Queen of Hearts," a prettily grouped design with two towers flanking a centre pavilion, and a quadrant colonnade on each hand. The exterior bandstand is placed in the colonnaded upper story of the semicircular centre pavilion; a much better position than in an apse with solid walls. The general design, however, is not so much the pure Classic Italian which the prize is intended for, and it has a practical defect in want of internal floor space. The other designs hardly call for special comment.

The Grissell Medal, as already observed, has attracted more competitors than usual this year, but we fear this is not because of the main object of the prize—constructional drawing, but because the subject—"A Stone Dome for a Porte-Cochère to a Public Hall," seemed to promise an opportunity for architectural effect. But that is not what the Grissell was founded for; it was to encourage the study of construction, and most of the designs sent in are quite wide of the mark: some of them do not even show the jointing of the stones. We do not call it satisfactory construction of a dome only 30 ft. in diameter, either, to depend on metal ties, as two at least of the competitors have done. "Golden Horn" is a very pretty and original design, but absolutely devoid of any constructional detail. On the other hand "H. I. M.," who has sent a clever and effective study shaded in Indian ink, has at least one too many joints, for the small semicircular windows in his dome must either have feather-edges at the top of the arch, or there must be a sham joint drawn across for symmetry; it is difficult to say which is the worse fault. The design of intercepting arches shown by "Sepia," is much more suited to the Gothic than the Classic type of work; the intersections of these groin-ribs do not present at all a satisfactory effect. The medal has been awarded to "White Rose," by Mr. J. B. Fulton, whose talent seems to break out in all kinds of unexpected directions. His design is dignified though perhaps a little too pompous, and he has shown all the jointing of his stonework most conscientiously. But we do not feel quite sure that the medal ought not rather to have gone to "Duomo" for a plain and unambitious design which gives a distinct predominance to the constructive problem, and is rather novel in its constructive treatment.

It must be admitted that the majority of the Grissell drawings this year elude the real object of the prize; and we think that, in future, subjects should be set which cannot well be treated otherwise than constructively, or at all events that if competitors persist in offering showy drawings instead of constructional drawings, the medal should be withheld.

The Owen Jones Studentship is deservedly won by Mr. Percy E. Nobbs. We think most of the drawings have been submitted before in this competition; the only one, in fact, which we do not remember is the design for an apsidal vault in glass mosaic. The design shows a very large figure of Christ holding a copy of—and evidently expounding—the Gospel; supported by a choir of cherubims, and accompanied by an adoring angel on either hand; over the figure is a small view of the heavenly city, similar in treatment to the view of St. Mark's in the thirteenth-century mosaic over one of the doorways to the atrium of that church. We do not like the border, which is too much like the noted Della Robbia pattern to be converted into glass mosaic. Another design is for the decoration of a church of the form and scale of S. Fosca, Torcello; the colouring is pleasant, but the drawings are too small in scale and too pulled about to get effects. The marble wall facing of the west transept, St. Mark's, Venice, is a useful drawing of the effect of marble in juxtaposition; the value would have been tenfold had the names of the different marbles been added. Of the sketches, that of one side of the Baptistry, Florence, is very nice, the subject being a difficult one. A medal of merit is awarded to Mr. L. R. Guthrie for his excellent set of drawings, the weakest feature of this set being the design for a domed chamber. It was a good idea to measure the waggon vaulting of the beautiful little church of S. Maria dei Miracoli, Venice. We should like some day to see a complete set of measurement drawings of this exquisite aisleless cinque-cento church. Two other good measured drawings in colour are—one of part of the arcading between the great piers supporting the domes of St. Mark's, Venice, the other the plan of the mosaic decoration in the flat dome of San Vitale, Ravenna. The careful drawings of Mr. James McLachlan are valuable records of the subjects measured, particularly the Ambone and pavement at S. Lorenzo, Rome, the longitudinal section of the Capella Palatina, Palermo, is good, but we remember that this has been done before, and much better done, by Mr. J. J. Joass, who won this studentship some years ago. Mr. McLachlan's drawings suffer from being a little crude in colour and mechanical in execution.

The "Pugin" drawings this year are rather disappointing. Mr. J. Harold Gibbons has won this very popular prize with a set of drawings that impress one with the sense of the immense labour taken compared with results. This set consists almost entirely of measured drawings, the principal feature of which is the quarter full-size drawing of the sedilia in St. Andrew's Church, Heckington. The amount of detail and finish expended upon this does not, in our opinion, add to the value of the drawing. A drawing of the

south porch, Leverington Church, is insufficiently described, though plans, sections, and elevations are all there. More interesting is the detail drawing of the tile pavement in Prior Crauden's Chapel, Ely; Chetham Hospital, Manchester, is also measured up very completely; and a fine oak font cover at St. Peter's, Walpole, Norfolk.

For picturesque choice of subjects, by far the most interesting set submitted is that by Mr F. C. Mears. Most of the subjects chosen are worthy of more careful delineation. The drawings are mostly tinted in colour, and are very able as far as they go; the measurement drawings include parts of the Lady Chapel Ely, coloured; a screen from Trunch Church, Norfolk—from which church also is shown a rough sketch of a beautiful font cover of unusual form; St. Mary the Virgin, Oxford, a large drawing of the complete tower and spire; and the Pastoral staff from New College, Oxford. Mr. A Muir sends a careful and well-chosen series of measured drawings which receive a medal of merit; the outline drawing are the best of these, such as that of the Percy shrine, Beverley, the fine door at Salisbury, the Galilee Porch, Ely; some arcading at Winchester; the Bridport tomb, Salisbury; where larger pieces of detail are shown the method of representation is too theatrical and pretty. Mr. O. P. Milne's pencil drawings are very direct and straightforward. If the prize-winners have erred on the side of over-elaborating their measured drawings, Mr. Stanley H. Hamp has spoilt an otherwise charming set of strainers by the very poorly drawn and chosen subjects for measurement. His pencil and colour sketches are from France, Italy, and England, and very charming indeed they are, both in touch and in feeling for colour; the subjects as light sketches are exceedingly well chosen, but they are rather mementoes of travel than serious studies of architecture.

Three competitors only submit measured drawings for the Institute silver medal, and these are below the average merit for this prize. "Iago" sends five strainers of a house called Balls Park, at Hertford; not an inspiring subject, and, indeed, unworthy of the labour of measuring. The choice of subject is of the first importance; it is improbable that a student can find time to make complete measured drawings of more than one or two extensive architectural subjects, and the educational training thus received is immense; the work undertaken should, therefore, be of the finest type within the student's reach. A well chosen subject is St. Martin's-in-the-Fields, by "Nix," but the drawing, though careful, is poor and uninteresting, due partly to the inadequate drawing of the ornament. The prize has been awarded to Mr. Andrew Rollo for his drawings of Craigievar Castle, Aberdeenshire.

The subject is an interesting one in itself, and shows in detail the right use of simple stone mouldings and ornament. The drawings are a business-like set, more particularly the plans and sections. The ornament is badly drawn, and there is no attempt to give a feeling of the texture of the materials employed, one of the charming features of the Scotch baronial style. The perspective drawings are so poor that the set would have been better without them.

ORDNANCE SURVEY MAPS.

SPECIMENS of the Ordnance Survey Maps of the United Kingdom were exhibited last week at the Royal Geographical Society's house in Savile-row. They were, we believe, mounted and framed a year ago for exhibition at Antwerp in a representative collection of the Government maps of different countries. All British architects, surveyors, and engineers know that our Ordnance Survey maps are far from perfect, but, on the whole, they are among the best published by the Governments of Europe, and when we remember the history of the Ordnance Survey, the wonder is, not that the maps are imperfect, but that the defects are not more numerous and important. It is a far cry to Culloden and the days of the Young Pretender, but we must hark back to this period to find the inception of the survey which now includes the whole of the British Isles. The same difficulty with which General Buller had to contend in his advance through Natal to the Eastern Transvaal, was encountered by the Duke of Cumberland's forces in the Highlands of Scotland before and after the battle of Culloden. There were no maps. As soon as some sort of order had been attained, Lieutenant-General Watson (in 1747) began to survey the turbulent Highlands for military purposes; the work extended gradually to the Lowlands, but was interrupted in 1755 by one of our many wars with France, and was not resumed till 1783, when the French Government asked the British Government to lay down a system of triangulation between London and Dover for the purpose of connecting it with the French system. The first base-line of this, the first English Ordnance Survey, was measured in 1784 by General Roy, an officer who had been associated with Lieutenant-General Watson in the survey of the Highlands of Scotland thirty years before. The line was measured on Hounslow Heath, and was rather over five miles long. By 1787 the triangulation was completed down to the Kentish coast. Then followed the French Revolution, and work was not resumed till 1791. First in a south-westerly direction, and then to the east and north, the primary triangulation was continued, until in 1809 Scotland was reached. The scale of 1 in. to the mile was adopted for the English maps, but progress was slow; indeed, the primary triangulation of the United Kingdom was not completed till 1852—sixty-eight years after General Roy measured his base-line on Hounslow Heath.

Ireland led the way to a new departure. In 1824 a Committee of the House of Commons recommended that the whole of the country should be surveyed and plotted to a scale of 6 in. to the mile, and in 1842 this survey was completed. Meanwhile, in 1838, the survey of Scotland was resumed, and two years later it was decided that the scale of 6 in. to the mile should be adopted for those parts of Great Britain which had not then been surveyed. Lancashire and Yorkshire and some counties of Scotland received the benefit of this decision.

But the battle of the scales was not yet at an end. In 1851 a Select Committee of the House of Commons abandoned the 6-in. scale for Scotland in favour of the 1-in., but local opposition secured a reversal of this decision in certain districts. Matters were complicated in 1854 by the adoption of a "natural" scale; this was the now familiar scale of $\frac{1}{2500}$, or 25·344 in. to the mile (often known as the 25-in. scale). In the following year a scale of $\frac{1}{500}$ was approved for towns containing more than 4,000 inhabitants, instead of the oppidan scale of 5 ft. to the mile which had previously been in use. It was also decided—wisely, we think—not to publish $\frac{1}{2500}$th-scale maps of uncultivated and thinly-populated rural areas.

Opposition was still maintained, and a Royal Commission (1858) and a Select Committee (1861) were required to settle the matters in dispute. The natural scale won the day, and has been in use to the present time. Opinions still differ as to the utility of the natural scale in a country whose measures are non-natural, but the balance of opinion is decidedly in favour of it. Certainly it brings us into line with the nations of Europe and the United States of America.

This brief historical sketch of the Ordnance Survey shows some of the struggles which have attended it, and may lead us to moderate the vigour of our grumbling when we find a map not wholly to our liking. But grumble we may, provided that we do it as gently as Bottom did his roaring.

The four principal scales of our English Ordnance maps are:—

1. $\frac{1}{63360}$, or 1 in. to a mile.
2. $\frac{1}{10560}$, or 6 in. to a mile.
3. $\frac{1}{2500}$, or 25·344 in. to a mile.
4. $\frac{1}{500}$, or 10·56 ft. to a mile.

In addition to these, there are old town maps drawn to a scale of $\frac{1}{1056}$, or 5 ft. to a mile, and what may be termed road maps to a scale of $\frac{1}{253440}$, or 1 in. to four miles. There are also still smaller index maps. Specimens of all these, with the exception of the last, were exhibited at the Royal Geographical Society's house last week. The specimens were carefully selected, both as regards subject and manner of execution, and would undoubtedly compare favourably with the foreign maps with which they were originally exhibited at Antwerp.

Three examples to the scale of 4 miles to 1 in. were shown. They were reduced from the 1-in. maps, revised between 1893 and 1897, and published between 1900 and 1902. The first was an uncoloured map of Berkshire, Wiltshire, Hampshire, &c., without contours or hill-shading; the second had Glasgow in the centre, and differed from the last only in having the water coloured blue; the third showed Durham and parts of the neighbouring counties, the water being coloured blue, parks green, and the hills distinguished by brown stumping. These are extremely useful road maps, the third being the best for pedestrians, cyclists, and motorists. There are no contour lines, but a general idea of the elevation of any hill can be obtained from the depth of the shading. These three specimens are single-sheet maps, and contain at the foot full particulars of the dates of revision and publication, and the usual notes. In all the other examples the descriptive matter has unfortunately been cut off by the mounter.

The scale of one inch to the mile was well represented by nine four-sheet maps—excellent examples of the cartographer's art. In three the hills were shaded with vertical hachures in black. The shading is admirably done, but in hilly districts it is so dark

as to obscure the details and the lettering. Two examples of a more recent type have black contour lines and vertical hachures in brown; these are much clearer than the original type, but the black contours are somewhat confusing. Only one example of the latest style is shown; this has brown hachures and red contour lines, and is undoubtedly the most satisfactory. The other maps of this scale are without hill-shading. Of course, in all these small-scale maps, the width of roads, canals, &c., is exaggerated for the sake of clearness.

The two examples of the 6-in. maps represent Southampton and Salisbury with their environs. Each map consists of one and a half sheets mounted together. The Southampton map is admirably engraved, the mud banks and parks being distinguished by very fine horizontal shading; public buildings, black; other buildings, hatched, and water coloured blue. The Salisbury map is without colour, and the public buildings are shown by darker hatching. The elevations are shown by contour lines.

Two cathedral cities—Winchester and Hereford—are selected as examples of the $\frac{1}{2500}$ scale, each map consisting of one and a half sheets mounted together. The Winchester map has the buildings hatched, water blue, and city boundary yellow. In the Hereford map, workshops are coloured neutral tint, other buildings pink, water blue, and the roads brown; the city boundary is not coloured. Of the two, we certainly think the Winchester example (with the buildings hatched) the more satisfactory; when architects, surveyors, and engineers use maps of this scale, they prefer the hatching, as it does not interfere with any colouring which they wish to apply. Of course, maps may be obtained without any colour at all, but, unless the buildings are hatched, there is a difficulty in distinguishing between buildings and small closes of land, and this is often a serious inconvenience.

The next maps in order of scale are the $\frac{1}{1056}$ or 5 ft. to a mile. These are the old town maps, published before the introduction of the $\frac{1}{500}$ scale. Two examples are given—one showing part of the City of York, and the other part of Westminster. Each map consists of a sheet and a half mounted together. The York map is very finely engraved, and shows a large amount of detail; the internal details of the plans of the minster, and of churches, chapels, and public buildings are carefully delineated, but no colour is used. In the Westminster plan the water is coloured blue, and the internal details of the Abbey and of the various churches are given, but not those of public buildings, such as the Houses of Parliament.

The last two maps are to the $\frac{1}{500}$ scale, and represent Edinburgh Castle with part of Princes-street, and part of Cambridge with Trinity College in the centre. These, like the $\frac{1}{2500}$ sheets, are heliozincographs, and are inferior to the older maps engraved on copper. The specimens selected are, however, better drawn and reproduced than most sheets of this scale, and the subjects are decidedly interesting. With the exception of outbuildings coloured neutral tint, the buildings on the Cambridge plan are coloured pink, and the walls of all colleges and churches are shown and coloured red; the windows, stairs, and other details of the colleges and churches are also delineated; the roads are coloured brown, and the water blue. In the Edinburgh plan the water only is coloured, the buildings being distinguished by half-tone shading. The latter style, although less pleasing to the eye, is, in some respects, more useful for the architect and engineer for the reason already given.

It will be seen that the exhibition included maps drawn to six different scales and in different styles for each scale. The scales ranged from $\frac{1}{25344}$ to $\frac{1}{500}$, and in no other country can this range be matched. According to a pamphlet by Colonel Sir John Farquharson on "Foreign Topographic Maps," the largest town-maps of France are to a scale of $\frac{1}{2000}$, and the general maps are $\frac{1}{800}$ (about $\frac{3}{4}$-in. to a mile), or rough photozinco enlargements of these to $\frac{1}{500}$; smaller scales, down to $\frac{1}{80000}$ (about $9\frac{1}{2}$ miles to an inch), are also used. In Belgium and Denmark the largest maps are $\frac{1}{2000}$, and the "Topographic" maps $\frac{1}{40000}$; in Germany, Switzerland, and Italy $\frac{1}{2500}$ and $\frac{1}{100000}$; in Sweden $\frac{1}{2000}$ and $\frac{1}{100000}$; in Austria-Hungary there are a few special maps of towns to scales of $\frac{1}{1250}$ and $\frac{1}{2500}$, and the general maps are $\frac{1}{75000}$. In other European countries there do not appear to be any government maps larger than $\frac{1}{80000}$ (about $\frac{3}{4}$ mile to an inch). In the United States the greater part of the country is drawn out to a scale of $\frac{1}{125000}$, more populous areas to $\frac{1}{62500}$ (almost exactly 1 in. to a mile), and less populous or desert areas to $\frac{1}{250000}$. In no country, therefore, is there anything approaching our survey of $\frac{1}{2500}$, and our $\frac{1}{500}$ town-maps are quite unique. That these large-scale maps have been of great service to county, borough, and other councils, and also to engineers in the preparation of schemes for railways, sewerage, &c., no one can deny; on the other hand, land-surveyors naturally object to such maps as interfering with their occupation.

But while, in the matter of variety and range of scale, little fault can be found with our Ordnance Survey Department, there is, in other respects, legitimate ground for criticism. The draughtsmanship displayed in many of the recent sheets is far below the standard formerly attained, but we need not labour this point; copper-plate engraving is too slow a process for modern requirements, and if it had been exclusively used, many of the maps would have been out of date on the day of publication; a more rapid process was necessary, and this was incompatible with the finest draughtsmanship. A much more important point is that of accuracy, and it is in this that we find the principal ground for criticism. Every professional man who has used the modern ordnance sheets has found in them numerous errors. Many features are omitted, and others are wrongly delineated. In the coloured maps, some buildings are left blank, while small closes of land are coloured as buildings. Any one well acquainted with a particular locality can, at the first glance, detect many errors in some of the sheets. In confirmation of his previous experience, the writer examined the plans of three old buildings—and only three—as shown on a recent sheet, and in every case the plan was wrong. We have heard of a man who wrote to the department complaining that his house, which had been in the occupation of his family for 300 years, was not shown at all, but whether his complaint was well founded or not, we do not know. Certain it is that some of the surveyors have scamped their work, and have trusted too much to sketching and pacing, and too little to tape and chain. More frequent revision of rapidly-developing areas is also desirable. Clearness is another essential of a good map, and in this respect the new small-scale maps with brown hill-shading and red contours are better than the old. There is still room for improvement, however, in the distinguishing of certain features, such as fences and small watercourses, &c. Two other criticisms and we have done. In the large-scale maps showing the levels, the bench-marks are not sufficiently numerous. Nearly all Councils now require the levels of new streets and sewers to be plotted from the Ordnance datum, and frequent bench-marks are therefore desirable, particularly in suburban districts. The index maps do not contain sufficient details in many cases to enable any one to order the sheet required; this is often a source of annoyance in places where stocks of Ordnance sheets are not kept.

On the whole, our Ordnance Survey is a work of which the nation may be proud. It is not perfect, but new and improved methods are being adopted, and when this is the case there is hope for the future. We went to the exhibition prepared to curse, but, like Balaam, remained to bless.

WATER SUPPLY FOR "DOMESTIC PURPOSES."

THERE is really no end to the ingenuity which may be expended on some Acts of Parliament. No one who has read the case of the Barnard Castle Urban Council *v.* Wilson, which recently came before the Court of Appeal, can fail to appreciate the pleasurable occupation which may be given to judges by a modern statute. The case in question turned upon the interpretation of Section 53 of the Waterworks Clauses Act, 1847: "Every owner and occupier of any dwelling-house . . . . within the limits of the special Act shall . . . . be entitled to demand and receive from the undertakers a sufficient supply of water for his domestic purposes." This statute has to be read with Section 12 of the Waterworks Act, 1863, which says that a supply of water for domestic purposes shall not include "a supply for any trade, manufacture, or business." The question of the interpretation of these sections becomes more and more important as the area of supply of water by public companies or municipal bodies is enlarged, a process which the last two dry summers has distinctly hastened.

Dealing first of all with the case in question the main facts were that the Governors of the North-Eastern County School, Barnard Castle, erected on their premises a swimming-bath, with a cubic capacity of 35,000 gallons, in a building outside the main building of the school, but connected with it by a corridor. The prospectus of the school stated that a swimming-bath was provided, and that the swimming-bath fee was 3s. 6d. a term, payable by every boarder. A swimming master was kept to instruct the boys, and a fee was paid by such day boys as used the bath. The Urban District Council contended that they were entitled to make a special charge for the water supplied to this bath, on the

ground that it was not used for domestic purposes, but for the purposes of a business. It was held by Mr. Justice Buckley that this supply was for domestic purposes. The Court of Appeal, however, came to a different conclusion. They endeavoured to limit the effect of this decision by stating that the section had to be interpreted in reference to the particular facts of the case, but in English law precedence has so much weight that this decision can scarcely fail to govern similar and, of course, identical cases.

The definition of the phrase given by Lord Justice Vaughan Williams was that "the use of water for the more convenient occupation of a house, or for increasing its amenities to the owner or occupier, is *primâ facie* a use for domestic purposes"; and, testing the case in this way, he came to the conclusion that a swimming-bath outside the house, under the circumstances of this case, did not fall within the section. It is perhaps more easy to say that such a use is not a domestic one than that it is for the purposes of a trade or business, and the real difficulty of the case—and of others in some degree like it which will no doubt arise from time to time—is that they occupy a kind of position between domestic and trade purposes which was probably never considered by those who drafted the Act of Parliament. Lord Justice Romer pointed out the difficulty of the case by some rather amusing illustrations. It might be reasonable, he thought, to regard water for a small tank for goldfish as used for a domestic purpose, but if an occupier desired to keep a private aquarium, he thought he could not require a water company to furnish him with a supply for it; but it is difficult to see how, if an individual chose to amuse himself with a private aquarium, the water could be said to be applied for the purpose of a business, though it might perhaps come within the term "ornamental purpose."

The truth seems to be that these statutes require to be amended. It has been held that a supply of water to a workhouse was a supply for domestic purposes, as the inmates were to be treated as one family. This very patriarchal idea of a workhouse *ménage* must be regarded as an ingenious judicial invention for the purpose of bringing the case within the Act of 1847. Another case, in which it was held that an occupier who carries on the business of a boarding-house keeper could demand the supply of water for the ordinary purposes of his house as one for domestic purposes, appears to be adverse to what must now be called the decision in the swimming-bath case. Another point which may be suggested is in regard to the supply of water for hydraulic lifts; and, indeed, the number of instances which any one can suggest on the border-line between the two statutes is endless. In the present case we cannot but think that the Court rather unduly narrowed the application of the statute, since, though swimming may be taught in a bath, this is *primâ facie* a thing which is required for domestic use, whether it be large or small; and we suspect that at the North-Eastern County School the boys who use the swimming-bath did without the domestic tub. As already observed, however, the only true way to put an end to the litigation which is beginning to crop up more and more on this question is by an amendment of the statute.

NOTES.

The Wellington Monument.

A LETTER by Mr. Spielmann in the *Times* a few days ago, in regard to a rumour that the Dean and Chapter of St. Paul's were taking steps to complete the Wellington Monument by the addition of the equestrian statue intended by Stevens, has led to a correspondence which has brought out the fact that a private Committee has been at work raising subscriptions and selecting a sculptor to complete the monument, in ignorance of the fact that the President of the Royal Academy has been endeavouring all this while to impress on the Government the duty of doing so. The Bishop of Stepney, who was concerned in getting up the private Committee and subscriptions, expresses his regret that he did not know of Sir E. Poynter's efforts with the Government; but his reply does not meet the case. As Sir E. Poynter says, the Wellington Monument is a matter of national interest; and we do not see that the Dean and Chapter of St. Paul's had the slightest right to consider it as their concern, and to appoint *sub rosâ* a sculptor of their own choosing, without any appeal to public opinion. Stevens's work is one of the greatest productions of modern English art, almost unique in its artistic character; and the selection of a sculptor to complete it is not a thing to be done in a corner. It is a matter of the greatest importance that the sculptor selected should be one of the foremost artists of the day, and one whose work would be likely to be in harmony with the grand style of Stevens's design. We have no assurance of this in the present case; and the action taken by the Dean and Chapter in initiating such a work on their own responsibility and without inviting public opinion, is a serious mistake. The Wellington monument is not a mere ornament of their Cathedral; it is a work of national interest, placed in the Cathedral, and for which they are responsible to the nation. They had no right to make their own private arrangements for its completion, and select their own artist; and the strongest practical protest ought to be made against such a procedure.

Trades Unions and the Workmen's Compensation Act.

AT the recent meeting of the Parliamentary Committee of the Trades Unions Congress, which was held in private, it appears the subject of discussion was the amendment of the Workmen's Compensation Act, 1897. Before these proposed amendments are made known, and hence speaking with strict impartiality, we wish to point out the effects which this measure—passed solely in the interest of workmen, and amounting practically to an insurance against death or injury in certain employments—has had on the labour market. Owing to the scale of compensation being fixed with reference to the "dependants" whom a workman leaves in case of death, viz., wife, parent, or child, employers of labour are already giving a preference to unmarried workmen who, unless they have a parent dependent upon them, only involve a liability in case of death of a sum not exceeding 10*l.* for medical or funeral expenses. In the second place, owing to the increased liability to accident of older men, and, moreover, to the fact that, if injured, the incapacity of older men is more likely to be prolonged or even to become permanent, it is becoming more difficult for men who have passed a certain age to procure employment. These causes, owing to the short time the Act has been in force, have hardly at present made themselves sufficiently apparent to obtain general recognition; but each year, as contracts are renewed, their effects on the labour market become more obvious, and we submit that a system of insurance chargeable on the employer will, in the long run, work to the injury of those classes of labourers who most require some assistance.

Elementary School Buildings.

MR. LLOYD GEORGE has issued a kind of manifesto to the Welsh County Councils on the subject of the Education Act. With most of this we are not concerned; but it contains one point which is worth the attention of the new Education Authorities throughout the country. Mr. Lloyd George advises the County Councils, before they take over any elementary school, to have it surveyed by a surveyor or an architect, and to insist that the building shall be in proper condition before it is taken over. This advice is obviously sound, for it will be impossible for the Education Authorities to know how much they ought to pay for fair wear and tear of the premises unless their actual condition is clearly ascertained by a skilled person before the Authority becomes liable. On the whole, we should say that the buildings of the Voluntary Schools are in a better state of repair than their opponents assert; nevertheless, it is highly desirable that their actual condition should be ascertained.

Chipping Wycombe Municipal Buildings Competition.

IN reference to this competition we have received the following letter from the Secretary of the Institute of Architects:—

"DEAR SIR,—The conditions for the Chipping Wycombe Municipal Buildings Competition contain the following clause:—

'The President of the Royal Institute of British Architects, or some architect to be nominated by him, will be asked to make these awards according to his judgment; but the Corporation do not undertake to carry out any designs, and reserve the right to select for erection any set of designs—whether awarded a premium or not—they may themselves prefer.'

The President of the Royal Institute of British Architects requests that you will kindly allow him through your columns to inform those concerned in the competition that, as he understands the promoters decline to modify this clause, he has been unable to nominate an assessor.—I am, yours faithfully, W. J. LOCKE, Secretary.

9, *Conduit-street*, January 20."

The President was quite right in declining to nominate under the circumstances. We have always held that a Committee may reasonably prefer to carry out a second premiated design instead of a first, if it suits their own wishes better; but they should undertake to carry out one of the premiated designs, otherwise the whole thing is a farce. In this case the Committee have shown their hand openly, and intimated pretty plainly that they are prepared to disregard entirely the assessor's judgment except in respect of the mere payment of the premiums; and architects who respect themselves will be wise to have nothing to do with this competition.

Flanged Pipe Joints.

A QUESTION which frequently arises is the determination of the most suitable method of joining pipes used for high-pressure steam, and in some cases the answer must be deferred until inquiry has been made into certain structural conditions of the pipes themselves. In wrought iron or steel pipes it is always important to see that the flanges are properly secured, that they are of adequate thickness, that their faces are of ample width and provided with an adequate number of bolts properly spaced, and that the flange faces are exactly parallel, so that they cannot be improperly strained when the bolts are tightened up. Undoubtedly the best joint is made with metal to metal, but cost is against it in all but exceptional cases. For the higher temperatures employed in the present day, ordinary india-rubber joint rings are unsuitable, but rings of asbestos material have been used with considerable success where the steam is perfectly dry, and in positions where water of condensation cannot collect. Asbestos suffers from the disadvantage that it is softened and gradually washed away by water, hence various forms of metallic joint rings have been introduced, sometimes with rubber and sometimes without. A form of "gasket" that gives general satisfaction consists of a soft metal ring with a reinforcing wire of copper; this ring being very easy to apply, and also having the advantage that no cementing material is necessary. Therefore, joints may be made, broken, and remade, with a minimum expenditure of time. For permanent work, a cement of red and white lead and iron filings, applied between two pieces of wire gauze, makes an excellent joint. As a general rule it should be remembered that no gasket should be used before it has been treated with plumbago, alone or mixed with tallow, to facilitate breaking of the joint when required. All steam pipes must be run so that water cannot collect along the line, and provision must be made for draining at predetermined points if leakage is to be avoided. Due attention to these points will frequently save much trouble and unpleasantness in connexion with an installation where steam-pipes are employed.

Electric Motor-cars.

THE paper on "Electric Automobiles," by Mr. H. F. Joel, read to the Institution of Civil Engineers last week is an important one, as the author's great experience with the management of accumulators has enabled him to test electric vehicles under favourable conditions. He states that perfectly trustworthy motor-cars can now be constructed, and that single journeys of more than a hundred miles can be made with one charge. In the earlier forms of electric vehicle far too small a battery was used. In an electric omnibus tried some years ago on muddy macadamised roads in London the battery was only 18 per cent. of the weight, and the wheels were only a little over 2 ft. in diameter. Under these circumstances it was not surprising that it stuck in the mud and the batteries were destroyed. In the electric cabs seen in the streets two years ago the battery weight was even a smaller fraction of the total weight than in the case of the omnibus. Modern cars have much larger battery power and their wheels are larger. Dr. Luxenberg has shown that the resistance to traction is practically halved by doubling the size of the wheels. Taking the cost of electric energy as 1½d. per unit, at which price it can be obtained at several stations in and around London, the cost of the energy consumed per ton-mile is only one-tenth of a penny. This cost compares favourably with any other system of self-propelled carriages. Going down hill also, the batteries can be charged by the motors, which then act as dynamos. The charge given going down a slope at 7½ miles per hour would be sufficient to carry the motor-car at least an equal distance on a level road. Mr. Joel proves that as the load is increased the cost per ton-mile rapidly diminishes. Hence, theoretically, for economical working every car ought to carry its maximum load. The difficulties in connexion with the wear and tear of rubber tyres are now being got over. The average distance traversed by the solid rubber tyres used in the old electric cabs before they became useless was under 500 miles. Recent trials by the Automobile Club have shown that pneumatic tyres can now be had which will last for more than 4,000 miles.

Cutting Angles of Tools for Metal.

IN a paper on this subject recently read before the Institution of Mechanical Engineers the author devotes special consideration to the influence of the cutting angle upon speed and feed. The factors controlling speed and feed are recognised as being of considerable importance by all who are concerned in engineering manufacture, and the paper to which we now refer possesses distinct value. In shops where hand-grinding prevails only the best workmen know what combination of tool angles will be most suitable for the work in hand, and even then the knowledge possessed is merely approximate, while it is rarely the case that such a workman can name the angles at which he aims, or check the accuracy of his grinding. For this reason the author very properly thinks that machine grinding should be adopted, to the entire exclusion of hand grinding. The results of some of the tests made by the author lead to deductions of great utility in dealing with tool steels of ordinary and special brands, and they also throw valuable light upon questions affecting the shapes and points of tools. Further, the information now afforded presents a reasonable basis for determining the cutting speeds with which those in authority may be satisfied, and it can be employed for the guidance of workmen in the shop. Rule-of-thumb methods still prevail to a certain extent in all engineering works, in spite of the general opinion that workshop administration in these enlightened days ought to be based upon a more defined foundation. Investigations of the kind to which we refer are calculated to bring about the desired reform.

Armoured Glass.

UP to the present time the employment of glass reinforced, or armoured, by metallic network has been more general in the United States than in any other country. On the Continent this combination is largely used in Germany, and to a smaller extent in France, Austria, Belgium, and Switzerland. A paper on the subject recently read before the Société des Ingénieurs-Civils, in Paris, presents a convenient summary of facts relating to the manufacture, strength, and uses of this material of construction. In the production of armoured glass, or *verre armé* as it is more elegantly termed in the French language, advantage is taken of the property possessed by glass of welding, so to speak, to metals, and the combination results in a product having characteristics which are of distinct value in constructive architectural work. The reinforcement is employed in the form of a network of fine wire, only slightly modifying the appearance and transparency of the glass in which it is embedded; the properties given by the incorporation being cohesion and tenacity. From the first of these it results that if a pane of armoured glass be broken or cut the fragments remain joined one to the other, and cannot be separated unless the iron network be cut by a suitable tool or broken by repeated bendings. From the second property it follows that a relatively high resistance to flexure is imparted, a result similarly obtained by the reinforcement of cement and concrete. Moreover, while ordinary glass breaks suddenly without giving any indication of impending failure, reinforced glass cracks or splits, but the pieces remain always joined together by the metal network. The resistance of the combination when rapidly heated is not less remarkable. Instead of suddenly "flying," the new material merely cracks, and the continuity of the sheet or pane is not destroyed. It will, therefore, be seen that reinforced glass is of great value in fire-resisting construction. It is quite suitable for employment as a substitute for sheet iron, or sheet iron with a filling of timber, in the construction of doors and shutters intended to prevent the spread of fire, and it really affords greater security than either of the materials mentioned. By reason of its tenacity, it offers a safeguard of another kind which may be utilised as a protection against burglary or theft from the windows of shops.

Pittencrieff, and Dunfermline.

IT is stated that Mr. Andrew Carnegie has purchased the estate of Pittencrieff, near Dunfermline, the place of his birth. Pittencrieff House, built in 1610 by Sir Alexander Clerk, of Edinburgh, stands within beautiful grounds wherein is also situated Malcolm Canmore's Tower, a relic of the castle which that sovereign erected upon an eminence rising out of the glen of Pittencrieff. The locality formed a favourite residence of the Kings of Scotland. Malcolm III., surnamed Cean Mohr, gave asylum there to Margaret, grand-daughter of Edmund Ironside and sister of Edgar Atheling, when seeking refuge in a bay of the Firth of Forth, since called St. Margaret's Hope; the cave which also bears her name lies to the north of Canmore's Tower. Malcolm married her in his castle at Dunfermline in 1070. Close by, and to the south-west of the Abbey, are the remains of the later palace in which were born King Charles I. and his sister Elizabeth, Queen of Bohemia. The palace occupies elevated ground overlooking the Ferm burn. The principal portion of the ruins consist of the south-west wall, 205 ft. long and 60 ft. on the outer buttressed side towards the ravine, whereof the lower part is considered to have been built during the reigns of Robert Bruce and his successor, David II. It is conjectured that a curious group of underground passages beneath some of the buildings afforded a pro-

tected communication between the palace and the abbey. There are openings to the surface for light and air, and from a middle vaulted chamber radiate three passages—one towards the abbey, and two leading to the storerooms and the western parts of the palace. The eastern portions of the ruins include the kitchen, which was vaulted and has two fireplaces. Beneath the kitchen is a spacious vaulted chamber, 44 ft. by 24 ft., and 14 ft. high. That part of the palace presents features of the eleventh century and twelfth century periods. On his marriage morning, King James VI. conferred the lordship of Dunfermline upon Anne of Denmark. The house he built for her there was pulled down in 1797, having been used latterly as a school and afterwards as a woollen factory. On the removal in 1819 of the soil in the eastern part of the abbey, founded by Malcolm III., for the building of a new church, were found remains of some Scottish kings, and amongst them the skeleton of Robert Bruce wrapped in lead, which was reinterred in the ancient choir beneath the tower of the present church. With the skeleton, of which the breast-bone had been sawn asunder for the removal of the heart, was found a copper plate, inscribed "Robertus Scotorum Rex." Malcolm and St. Margaret were buried on the east side of the Abbey, which their sons, Alexander I. and David I., completed, and Bruce restored after it had been burned by Edward I. The early reformers converted the nave into a Presbyterian place of worship, and zealously pulled down the rest. A tower with an archway, joining the palace to the abbey buildings, stands across the road to the Pend and St. Catherine's-wynd.

The French Church, Waterford.

UNDER the provisions of the Ancient Monuments Act, the Board of Works, Dublin, have taken into their care the French Huguenot church at Waterford. The church has its origin in the Franciscan monastery of Friars Minor, established in the town by Hugh Purcell in the earlier half of the thirteenth century, of which a portion was given to the Huguenots who sought refuge in Waterford. At the dissolution, Henry Walsh had purchased the buildings and founded therein the Holy Ghost Hospital for the poor, incorporated by an Act of 36 Henry VIII. The ruins comprise the choir, converted into a burial ground for the French church, the tower and nave, and one transept. Some curious pieces of ancient sculpture have been preserved, together with many sepulchral monuments bearing inscriptions which now, for the most part, are illegible.

"The Romance of Architecture."

AT the London Institution, on January 15, the Rev. Walter Marshall lectured on "The Romance of Architecture." Although the title was rather a misnomer, Mr. Marshall told much that was of the greatest interest to lovers of parish churches, and showed a series of excellent lantern-slides illustrating some of the best examples. His reference to the almost entire destruction of the Rood loft was illustrated by a few well-selected slides, including an interesting example of the later substitution of the Royal Arms in the magnificent seventeenth-century Jacobean interior at Croscombe. The examples of sanctuary knockers from St. Gregory's, Norwich, St. Nicholas, Gloucester, and the well-known Durham knocker illustrated three distinct and beautiful types of mediæval ironwork.

Pure Air Without Draughts.

AN interesting lecture under this heading was given by Dr. Glover Lyon at the Camera Club, on January 12, when he also practically and successfully demonstrated his methods of ventilation. Members of the club appeared to be much impressed by the greater purity and pleasantness of the atmosphere of their room, which on most lecture nights was declared to be almost unbearable. A more detailed description, accompanied by illustrations, will appear shortly.

A French Opinion on the *Builder*.

OUR contemporary *L'Architecture* is kind enough to reproduce, in its issue of the 17th inst., the elevation and details and a photograph of our little front in Catherine-street, and adds some remarks which we quote not so much from vanity as for another reason mentioned below. *L'Architecture* observes:—

"Le *Builder* (*le Constructeur*) est certainement la plus ancienne publication périodique d'architecture existant actuellement dans le monde entier. Créé deux ans après la *Revue Générale de l'Architecture et des Travaux Publics* de César Daly, aujourd'hui disparue, ce journal est dans sa soixante-et-unième année d'existence. Sa prospérité a été très rapide, elle s'est toujours maintenue; tout porte à croire, et nous le souhaitons, qu'elle se maintienne encore durant des années et des années.

Nous comprendrions difficilement, en France, un journal hebdomadaire d'architecture conçu selon le plan du *Builder*. Chaque numéro de celui-ci contient, en effet, soixante colonnes de texte en petit caractère, parsemé de quelques illustrations, non compris plusieurs colonnes de renseignements divers, et une moyenne de huit pages hors texte de dessins."

Some months ago, an American architectural publication, which makes it a special object to praise everything French in connexion with architecture, and belittle everything English, had the assurance to inform its readers that the English architectural journals seemed hardly worth notice to those accustomed to the excellences of the French and German architectural papers—especially (strange to say) in respect of their illustrations. Perhaps it may be instructive to the gentleman who penned this remarkable opinion to see what a French journal itself thinks on the subject. And we make the remark not only on our own account, but on that of English architectural journalism generally, which, as far as weekly papers are concerned, is easily ahead of any other country. Such monthly publications as the *Rundschau*, and as our old friend César Daly's *Revue Générale* (the best architectural periodical ever issued), are of course on a different footing, and are published under different conditions, from a weekly paper.

THE SIGNS IN LOMBARD-STREET.

ONE of the most successful schemes of outdoor decoration made in readiness for the Coronation festivities last year was the revival, at the instance of a local committee, of some of the bankers' and traders' hanging signs in Lombard-street. All of them had been taken down as "dangerous and obstructive" in the interval 1763-6. Most of the signs lately set up are authentical copies of their originals, and are hung with their own separate electrical lights upon ornamental iron brackets and frames designed, we are informed, by Mr. Starkie Gardner. Besides giving a most pleasing relief to the lines of a narrow and somewhat sombre thoroughfare with their variety of shape, device, and colour, the signs recall many incidents of local and historical interest. They are worthy of a few words of passing notice, inasmuch as their removal is decreed by the Public Health Department of the Corporation of the City.

What Addison calls "a certain street of the greatest credit in Europe" has retained its name and its association with banking-houses since the Jewish merchants, and after them the Longobards, made it their resort, or exchange, early in the thirteenth century. Stow records that

"Edward II., in the twelfth of his reign, confirmed a messuage . . . . abutting on Lombard-street towards the south and towards Cornhill on the north, for the merchants of Florence. . . . . The meeting of which merchants and others there continued until the 22nd day of December in the year 1568; on the which day the said merchants began to make their meetings at the Royal Exchange."*

In 1379 Richard II. grants William Salisbury, goldsmith, to hold the Exchange in Lombard-street (see Lloyds' Bank); and in 1537 Sir Richard Gresham proposes to Cromwell, the Lord Privy Seal, "to make a goodly Burse in Lombert-streete for merchaunts to repayre untoe," after the manner of the Bourse at Antwerp. His son, Sir Thomas Gresham, kept his "shop" or counting-house during the latter thirty years of his life at the sign of the Golden Grashopper (his family crest) where is now Martin's Bank; in his correspondence he often cites "how the Exchange passeth in Lombard-street" at a time when, as Hentzner repeats, it was considered to be the handsomest street in London. Hentzner writes, 1593, that he saw there all sorts of gold and silver vessels, coins, &c., exposed for sale. Most of the goods were forfeited pledges: much of Sir Thomas Gresham's effects consisted of gold chains. The public office of No. 68, Martin's Bank, Ltd., occupies the site of Gresham's counting-house; a tradition obtains that on that same spot had stood the house of Wm. (or Matt.) Shore, goldsmith, whose wife was Jane, a daughter of Thomas Wainstead, of Cheapside, mercer. Alderman Richard Shore died in 1510, and endowed a chauntrey in the neighbouring church of his sepulture, St. Mary Woolchurch Haw—its site is now that of the Venetian and Long Parlours in the Mansion House. But the *Morning Post* of November 10, 1818, avers it could be proved by old leases that William Shore's house had been at No. 43, by the corner, north-east, of Grace-church-street, which a conveyance of 1667 cites as "a messuage knowne by the sign of the Three Crowns in the parish of Alhallowes in Lumbor-streete."

Pope's Head-alley, still marked with a carved stone sign of a head wearing a papal tiara, and the former tavern by that sign which is cited in the record of a wager made between two goldsmiths in 1464, commemorate the time when "merchants" from Rome chaffered in the street with their wafer-cakes and pardons. Sir Martin Bowes, the wealthy goldsmith (*temp.* Queen Elizabeth) lived in a house—where is now No. 67—at the sign of the White Lion, afterwards the Anchor, which he devised to the Goldsmiths' Company. The sites of No. 65—which was formerly the Salutation Tavern, and in our day Overend, Gurney, & Co.'s—of the Black Bull, and of No. 67, the Anchor, have been absorbed by Messrs. Glyn, Mills, Currie, & Co.'s premises as enlarged since that firm removed in 1827 to the Anchor from Birchin—or, more correctly, Birchover—lane.

The *Little London Directory* of 1677, the earliest known book after its kind, contains a nominal list of goldsmiths "who keep running cashes." Twenty-seven of them have their places of business, with signs, in Lombard-street. Some fifteen years ago Mr. F. G. Hilton Price succeeded in determining the later postal numbers of seventeen out of those twenty-seven houses, and it is mainly to his researches that we owe the identification, as to number with site in each instance, of nearly seventy out of the one hundred and four signs which are known to have once existed in that street. The ascertained number is great, and there were many more of which all record is

* Sir Thomas Gresham's Bourse on Cornhill, designed by Henrycke, the Fleming, was begun on June 6, 1566, and finished on December 22, 1568: Queen Elizabeth named it the Royal Exchange at her visit on January 23, 1571. See Burgon's "Life of Gresham."

lost; yet we should remember that until W. Mountague, the City Architect, laid out King William-street in 1824-30, Lombard-street extended as far as the Mansion House, and that the present space in front of St. Mary Woolnoth Church was covered by the former Nos. 1-10, as well as by Dove-court and Little Lombard-street.

Crossing over to the north side we see at No. 81 the sign of the Seven Stars, which marks a boundary of St. Mary Woolnoth parish. No. 81, latterly Brooks & Co.'s banking-house, and No. 82, were rebuilt by the late E. I'Anson, who was the architect also of No. 74. At No. 78, until very recently the Provident Life Office, the handsome sign of the Cardinal's Hat (or Cap) commemorates a tavern cited by Stow, and which in the seventeenth century was called the Cock. The device of the Vine, or Grapes, marks No. 77, Parr's Bank; at No. 68, the Golden Grasshopper marks the banking-house of Martin's Bank, of which the south and main front portion was rebuilt in 1793-4, and the rear portion in Change-alley in 1874 after Mr. R. Norman Shaw's designs on the site of the old Garraway's Coffee House burned, together with Jonathan's and Robin's on March 24, 1748. There was a Martin, goldsmith, *temp.* Elizabeth. The bank is one of the oldest in London. In, or about, 1672, Charles, afterwards Sir Charles, Duncombe and Richard Kent, who had been clerks of Alderman Backwell, began business in co-partnership as goldsmiths at the Golden Grasshopper standing between the Plough (now Glyn's) and the Unicorn, the house of Backwell, who built Change-alley in 1668 9. Sir Charles Duncombe, the "Euclio," it is supposed, of Pope's satire, retired in 1695, and bought "at near 90,000*l.*," Evelyn says, Helmsley, since Duncombe Park, Yorkshire, from George Villiers, second Duke of Buckingham. His niece and heir, Mary, became ancestress of the Lords Feversham. Duncombe House, designed by Vanbrugh, has been rebuilt, after the fire of January 11, 1879, from Mr. Young's plans and designs. In 1703 the banking business had passed to Stone & Martin; in 1891 Martin & Co. registered themselves as Martin's Bank, Ltd. Messrs. Glyn, Mills, Currie, & Co., choose—out of several—for No. 67, the Anchor, which we have already noticed, and a very fine piece of work it is. From No. 62, Commercial Bank of Scotland, hangs the Cat and Fiddle—a sign which many interpret in many ways. The simplest solution seems to be the most probable, a combination of two incongruous badges is not infrequent, and was often adopted when an apprentice, starting for himself, joined his former master's device to his own. No. 60, formerly Barnetts, Hoares, Hanburys, and Lloyds, and now the Canadian Bank of Commerce, displays the King's Head (Charles II.), of which there is record, on that spot, in 1677; the Ram, equally old, appears again at No. 58, where before the Great Fire had been the George Inn, whence the name of George-yard. On the south side is, as the east end, the block Nos. 39-40, built after designs by Messrs. Francis in 1866-7, and distinguished with the Blackamoor's, or Morocco's Head—a striking device on a red ground; at No. 28, Royal Insurance-buildings, having a Renaissance elevation by Mr. John Belcher, hangs the Artichoke, which is repeated at No. 24, Alexanders & Co.'s, of which building (formerly Nos. 24-5) Mr. John Whichcord the younger was architect; No. 27, at one time the Queen and Sun, carries its later sign of the Queen's Head. The Phœnix is appropriately restored to No. 19 (formerly Nos. 18-20), the offices of the Phœnix Fire Assurance Co. No. 28 is illustrated in our number of June 6, 1857.

In view of Mr. Hilton Price's valuable and illustrated work published in 1887, we need not enumerate the multitudinous other signs which might, and with due regard to their authenticity, have been replaced on the eighty-four houses in Lombard-street. As, however, some of the postal numbers have been altered since, and many of the premises have been rebuilt in recent years, we may here add that P. C. Hardwick was the architect of No. 15, Robarts, Lubbock, & Co.'s (1864), on the site of the house built for Robarts & Curtis by Thomas Leverton in 1796, where had been the White Bear, afterwards Pontack's (or Puntack's) Head, and then Lloyd's Coffee House at the corner of Abchurch-lane; he was architect also of No. 54, Barclays & Co.'s Bank, at the corner of George-yard. No. 21 (formerly Nos. 21-3), the London and County Banking Co.'s, in the Tuscan style, is by C. J. Parnell, and was built in 1860-1, with, it is said, stones of old Westminster Bridge; the premises have since been enlarged on the site of No. 20; the London and County Bank removed in 1846 from No. 71 (see Lloyds). Nos. 60 and 62, formerly Barnetts, Hoares, Hanburys, and Lloyd's, were altered and enlarged in 1838 by Sampson Kempthorne, of Gloucester; the house by Byng (1823) at the corner of St. Clement's-lane gave place to the Royal Insurance-buildings. No. 26 is by Edmund Woodthorpe the elder (*obiit* 1887). Lloyds, Barnetts, and Bosanquets', the Black Horse, as rebuilt in 1886-7 on the sites of Nos. 71-3, has absorbed the Exchange (afterwards the Acorn), the Union, the Fox, and the Bunch of Grapes, together with Nos. 26-7, Change-alley and Nos. 7-8, Pope's Head-court. The block now numbered 1-6, near the Mansion House, was designed by Sir Robert Smirke, R.A. No. 1 stands on the site of Harley & Co.'s, at the Cock; Smith, Payne, & Smiths removed thither in about 1840, their London house having been established in 1758 at No. 18, The Hare, since absorbed by the Phœnix Fire Office. In July last the firm was amalgamated with the Union Bank of London. Through these and other changes it has come about that perhaps the oldest commercial building of importance in Lombard-street is the offices of the Pelican Life Insurance Co., designed for Sir Charles Asgill by Sir Robert Taylor in or about 1756. On the front is a sculptured group executed by the Coades, of Lambeth, from designs by Lady Diana Beauclerk. Until the building of Lloyds Bank, No. 71 marked the position of the original Exchange and of a house by that sign. "Baker's" chop-house, with its old front, has been the last survivor in Change-alley, where the central block—formerly "Sam's"—is supplanted with premises designed by Messrs. Davis & Emanuel. The "Swan" and "Jonathan's" formed the east and west sides of the central block. Mr. J. H. Rowley was architect of the New City Club in George-yard, illustrated in the *Builder* of September 3, 1864. Pope's birthplace, No. 2, Plough-court, was demolished in 1872.

SURBITON CLOCK TOWER COMPETITION.

WE cannot congratulate Surbiton on the result of its Clock Tower Competition. No less than 116 designs were sent in to compete for this memorial, and, after several inspections by the committee, their choice has fallen upon the design by Mr. John Johnson, submitted under the title, "Experience." The committee have only themselves to thank that they have got such a comparatively poor design; had they gone to the expense of appointing a competent assessor and published his name, many good designs would have been submitted to them. Without an assessor artists will not compete, experience showing that when the choice is left in the hands of a lay committee, designs of real excellence are passed over for popular travesties of architectural design. The present instance is no exception, many designs submitted being preferable in every way to that chosen.

The winning design is a dull Gothic erection of good proportions, showing a great deal of carved ornament and sculpture which will have to be omitted, even where it be of the worst description, if the tower is to be built for the specified sum of 700*l.*

One of the best designs submitted is that distinguished by an hour glass, the author of which must be of a sanguine temperament to expect a committee of laymen to notice a design so inadequately depicted. A nice little design is that by Mr. H. M. Fletcher, showing a twelve-sided stalk with an hexagonal drum for the clock surmounted with a copper-domed roof and gilded vane. A design better in intention than in execution is shown by Mr. Gerald Warren, based on a colour treatment obtained by contrast of red brick. Portland stone and richly decorated panels, and clock face in mosaic and enamel. "Dum Spiro, Spero" shows a plain stock brick tower with angle buttresses, hipped roof behind a brick and stone parapet, with the clock under a stone pediment; the lines of the design are good. It needs much refining and more cheerful means of representing it. A dainty Renaissance design shown by good drawings is submitted by "Patriot," and a severe but excellent design in Portland stone is shown by "Edward VII.," perhaps considering the historic occasion the memorial is to commemorate, this would have been the most suitable to carry out of all those submitted. A design based upon the use of red brick as the principal material, by "Fleetwood," is quiet and restrained; we think it would have been better without the lions and shields at the angles. This is another design that would be infinitely preferable to that selected. "Aiblins" submits a free Renaissance design dwarfed by a most enormous metal crown on the summit, the clock forming a mere incident in the design; this set is well drawn. Alternative designs with a claim to originality are shown by "L. N. Z.," a stone tower, windowless, with a certain monumental character. Of original designs that one can contemplate without exhaustion is that by "Iseth," which shows thin projecting angle buttresses pierced with a species of tracery carrying a monumental clock on top; we suggest that this would look well executed in Doulton ware. "Surrey Comet" exhibits a workmanlike design of unpleasant proportions, due perhaps to the over emphasis of the different stages. The design by "G. E. R." shows an ingenious treatment, which we fear looks better on paper than it would in stone.

A triangular plan has been adopted by "Crown" with not very happy results. "South Barton" sends a good design, well drawn in a bold pencil manner; the point of view of the perspective we do not understand. "Finis Coronat Opus" is a smooth little design illustrated by a good water-colour drawing.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday evening, at the Rooms of the Institute, 9, Conduit-street, Mr. Aston Webb (President) in the chair.

Deceased Members.

Mr. Alexander Graham (Hon. Secretary) announced with regret the deaths of Mr. W. Wimble, who was elected a Fellow in 1888; Mr. Jas. F. Wadmore, Associate, elected in 1865; and Mr. Albert Charles Breden, Associate, elected 1892.

Donations to the Library.

Mr. Graham further announced the receipt of books for the library, a list of which was published in the last number of the "Journal," and said that Mr. Sydney Smirke had made a fourteenth donation of 5*l.* to the library fund. He moved in a formal way that a vote of thanks be accorded to the donors of the books, and especially to Mr. Sydney Smirke for his kind donation.

Elections.

The meeting proceeded to the election of candidates for membership under by-laws 7, 8, and 9. The following applicants were elected, viz.:—Fellows: Mr. Thomas Edgar Eccles, Liverpool, elected an Associate in 1890; and Mr. William Chasen Ralph, of Wigan. As Associates: Mr. Archibald Lawrence Holder, of London; Mr. Horace Moger, of London; and Mr. James Maclaren Ross, of London.

Prizes and Studentships.

The Secretary read the Deed of Award of prizes and studentships for 1902-3, made by the Council in writing under the common seal, in accordance with by-law 66.

The Essay Medal and Twenty-five Guineas.—Three Essays entitled "A Comparative Review of the Various Past and Present Systems of Architectural Training at Home and Abroad," were received for the Silver Medal under the following mottoes:—1. "All British." 2. "Ars quatuor coronatorum." 3. "Lindis." The Council regret that they are unable to award the Medal, but they have granted a Certificate of Honourable Mention to the author of the Essay bearing the motto "Ars quatuor coronatorum" [M. T. A. Griffith, Malvern].

The Measured Drawings Medal and 10l. 10s.—Three sets of drawings were sent in of the several buildings indicated, and under motto, as follows:—1. Iago—5 strainers (Balls Park, Hertford); 2. Nix—6 strainers (St. Martin's-in-the-Fields); 3. Philabeg—5 strainers (Craigievar Castle, Aberdeenshire). The Council awards the silver medal and ten guineas to the delineator of Craigievar Castle submitted under

the motto of "Philabeg" [Mr. Andrew Rollo, Glasgow].

The Soane Medallion and 100l.—Twenty-one designs for a town church were submitted, under the following mottoes:—1. Advance!—8 strainers; 2. Bee—7 strainers; 3. "Como"—4 strainers; 4. E Natura Architectura—6 strainers; 5. "Fides"—5 strainers; 6. Fioretto—4 strainers; 7. Ich Dien—7 strainers; 8. ΙΧθυς—6 strainers; 9. Lauda Finem—7 strainers; 10. Medici—6 strainers; 11. "Neni"—7 strainers; 12. "Ne Oubliez"—7 strainers; 13. "New Era"—7 strainers; 14. Φωτζ—6 strainers; 15. Perseverando—6 strainers; 16. "Rodari"—7 strainers; 17. Sanctus—8 strainers; 18. Xerxes—6 strainers; 19. X—5 strainers; 20. ·X·—5 strainers; 21. Device of a Patriarchal Cross—8 strainers. The Council have awarded the medallion and (subject to the specified conditions) the sum of 100*l.* to the author of the design bearing the motto of "ΙχθυC" [Mr. E. F. Reynolds, Birchfield], and a medal of merit to the author of "Como" [Mr. F. C. Mears, South Kensington, S.W.], and "X" on grey strainers [Mr. C. Wontner-Smith, Finchley, N.].

The Owen Jones Studentship and 100l.—Three applications were received for the Owen Jones Studentship from the following gentlemen:—1. L. R. Guthrie—6 strainers; 2. James M'Lachlan—6 strainers; 3. Percy E. Nobbs—2 strainers. The Council have awarded the certificate and (subject to the specified conditions), the sum of 100*l.* to Mr. P. E. Nobbs, M.A. Edin., Chelsea, S.W.; and a medal of merit and 10*l.* 10s. to Mr. L. Rome Guthrie.

The Pugin Studentship and 40l.—Eight applications were received for the Pugin Studentship from the following gentlemen:—1. J. Harold Gibbons—6 strainers; 2. W. S. A. Gordon—5 strainers; 3. Stanley H. Hamp—7 strainers; 4. O. P. Milne—5 strainers; 5. F. C. Mears—6 strainers; 6. A. Muir—6 strainers; 7. J. Myrtle Smith—6 strainers; 8. P. J. Westwood—6 strainers. The Council have awarded the medal and (subject to the specified conditions) the sum of 40*l.* to Mr. J. H. Gibbons, Manchester, and a medal of merit and 10*l.* 10s. to Mr. A. Muir, Hammersmith, W.

The Godwin Medal and 65l.—Four applications were received for the Godwin Bursary from the following gentlemen:—1. H. B. Cresswell; 2. H. Phillips Fletcher; 3. A. Dunbar Smith; 4. A. Maryon Watson. The Council have awarded the medal and (subject to the specified conditions) the sum of 65*l.* to Mr. A. Dunbar Smith.

The Tite Certificate and 30l.—Fourteen designs for a pavilion in a public garden were submitted under the following mottoes:—1. Altiora—6 strainers; 2. Archivolt—8 strainers; 3. Ariel—5 strainers; 4. Caber-feidh—5 strainers; 5. Forum—7 strainers; 6. "Le Nord"—8 strainers; 7. Lindisfarne—4 strainers; 8. "Lux"—4 strainers; 9. Mime—8 strainers; 10. Mulciber—4 strainers; 11. Pax—7 strainers; 12. Phœnix—4 strainers; 13. Queen of Hearts—5 strainers; 14. St. Winifred—5 strainers.

The Council have awarded the certificate and (subject to the specified conditions) a sum of 30*l.* to the author of the design bearing the motto "Caber-feidh" [Mr. D. Smith, Streatham Hill, S.W.].

The Cates Prize.—Two applications for the Cates Prize were received from the following gentlemen:—1. Baxter Greig—11 strainers; 2. A. Halcrow Verstage—22 strainers. The Council have awarded the Cates Prize of 40*l.* to Mr. A. Halcrow Verstage, Meadrow, Godalming, Surrey.

The Grissell Gold Medal and 10l. 10s.—Eleven designs for a stone dome over a porte-cochère to a large public hall were submitted under the following mottoes:—1. Blunderbuss—3 strainers; 2. Civic—3 strainers; 3. "Duomo"—2 strainers; 4. Golden Horn—3 strainers; 5. H.I.M.—2 strainers; 6. Notts—2 strainers; 7. Quercus—4 strainers; 8. Red Rose—2 strainers; 9. "Sepia"—4 strainers; 10. White Rose—4 strainers; 11. "Z"—4 strainers. The Council have awarded the Medal and 10*l.* 10s. to the author of the design bearing the motto "White Rose" [Mr. J. B. Fulton, Gordon-street, W.C.].

The Ashpitel Prize, 1902.—The Council have, on the recommendation of the Board of Examiners (Architecture), awarded the Ashpitel Prize (which is a prize of books value 10*l.*, awarded to the candidate who has most highly distinguished himself among the candidates in the final examinations of the year) to Mr. W. Greenwood, of Blackburn.

Owen Jones Studentship, 1901.—The Council have approved the drawings and design of Mr. J. Hervey Rutherford, who was awarded the Studentship in 1901, and who travelled in Italy, Sicily, and Spain.

Owen Jones Studentship, 1902.—The Council have approved the drawings and design of Mr. E. H. Bennett, who was awarded the Studentship in 1902, and who travelled in Italy and Spain.

Godwin Bursary, 1902.—The Council have approved the Report of Mr. Chas. A. Daubney, who was awarded the Godwin Bursary in 1902, and who visited the United States of America to study fire escapes in American commercial buildings.

Pugin Studentship, 1902.—The Council have approved the work of Mr. C. Wontner Smith, who was elected Pugin Student for 1902, and who travelled in Gloucestershire.

Tite Prize, 1901.—The Council have approved the work of Mr. Walter Fairbairn, who was awarded the Tite Prize for 1901, and who travelled in Italy.

Science Workshops for Schools and Colleges.

Professor Armstrong then read a paper on "Science Workshops for Schools and Colleges," of which the following is an abstract:—

Professor Armstrong said that the importance of experimental studies carried on with the object of affording training in scientific method, as a necessary part of the ordinary course in schools generally, whatever their grade, was already so widely recognised that ere long every school would need its workshops as well as its classrooms; it was therefore desirable that the general character of the requirements should be understood, in order that buildings may be properly designed to accommodate all necessary fittings and appurtenances—and more particularly to afford the necessary working space. The whole question of school design might assume a very different aspect in years to come; indeed, the architect might play a by no means unimportant part in helping on reforms which many thought to be very necessary if practical work was to take its proper place in the ordinary curriculum of every school.

Professor Armstrong illustrated his arguments largely by reference to the new buildings at Horsham for Christ's Hospital School,* erected to accommodate 800 boys, from the designs of the President and Mr. Ingress Bell. When the position and size of the science block with reference to the other school buildings was noted, it would be obvious that extraordinary importance would be attached to experimental studies in the school. The science block occupied practically one side of a quadrangle, the opposite side of which was occupied by the chapel, the classrooms and school hall filling the third, the dining-hall the fourth side. The floor area of the ordinary classrooms was 15,482 sq. ft., that of the rooms in the science block was 10 326 sq. ft.

But the provision which would be made at Horsham for work such as he was contemplating would not be confined to the science block. At no distant date, he trusted, there would be distinct workshops for manual training in wood and metal; and the engineering appliances generally would afford opportunities for the instruction of the more advanced boys in the use of machinery. Moreover, surveying and map making would be practised in the country round and there would be abundant opportunity for other out-of-door studies; besides school gardens, a set of experimental plots were now being laid down on the lines of those at the Rothamsted Agricultural Station which had so world-wide a renown. Christ's Hospital School, in fact, ere many years, should be a model school; its buildings marked an extraordinary advance—far greater, perhaps, than most of those connected with them realised. As one of the Governing Body, Professor Armstrong asked to be allowed to say how much he appreciated the great work which Mr. Aston Webb and his colleague had carried out; in watching the progress of the buildings he realised how many things the architect must be to all men.

In designing science workshops the architect and his technical advisers should have three S's in mind—sense, simplicity, and space. There should be due knowledge and understanding of the requirements to be met—mere copying should be impossible. The provision made shou'd be of the simplest character possible, because simplicity of provision conduces to simplicity of practice; and the space should be ample, for, given sufficient space, almost anything may be done, and to grant proper space is to show proper respect.

Money spent on judicious ornamentation would always be well spent in the case of a school. Far too little heed was paid to the influence which surroundings exercised on young people; if we are ever to recover the sense of artistic feeling, we must do far more to make our schools attractive. The disregard of property which seemed to be so characteristic of boys at the present day was probably a consequence of the fact that at school they were not placed under conditions which would lead them to be mindful of their surroundings. "Thinking in shape," to quote Thring at Uppingham, was one of the most powerful means of stimulating the imagination and the æsthetic faculties; it was easy to carry out the idea in these days, as magnificent photographic reproductions of the masterpieces of nature and of art were to be had at comparatively small cost: hence neither classroom nor corridor should be without its picture-rail. He would also plead for a more liberal use of colour in our schools.

The fittings at Christ's Hospital were not thought of until long after the building was designed; but, to secure the best result, the building should be designed to the fittings. The science workshops at Christ's Hospital differed in an important manner from the laboratories hitherto provided for schools—there were four main rooms in which classes were held, and to each of these was attached a number of subsidiary rooms. No lecture-room was provided—an omission of set purpose, as it was purposed to discourage didactic teaching. Full provision was made in each room for such didactic teaching as might be necessary; there was a demonstration bench, in front of which sufficient space was left free where seats could be placed; or uprights could be fixed, provided with small desk tops, where students could stand and take notes. No special balance-room was provided. A novel fitting, the balance-bench, had been introduced; this was merely a long narrow table (3 ft. by 12 ft. by 3 ft. 6 in. high) covered by a glazed case for the protection of the balances. Instead of having a number of balances within separate glazed cases, one large glazed case had been provided to contain a number of separate uncased balances. The balances placed in such a case are those required for all ordinary work. The more delicate balances required for advanced work were always provided with a case; and, as the sensitive working parts were of agate, there was no need to keep them in a separate room; they were conveniently placed on brackets against the wall.

A third special feature of importance was the store or stock room attached to each of the four workshops. This was intended not only for the ordinary stores, but also and especially as a room in which the apparatus for experiments left unfinished at the end of a lesson might be set aside until the next attendance.

Professor Armstrong followed with a detailed description of the more important fittings required—viz., working-benches, cupboards, sinks and drains, ventilation hoods, and various special appliances. Referring to the regulations of the science branch of the Education Department which specify a water-tap and sink for every two students, the lecturer stated that such a provision was quite unnecessary. The class of work now advocated for schools required the use of water but seldom. Architects must harden their hearts on this point; there was no more reason why sinks should be everywhere in a laboratory than there was to have one in every room in a dwelling-house. The economy involved in localising the water-supply, sinks, and drains was very great. At Horsham, in the rooms on the upper floor, all sinks were placed near to the walls, and the waste was carried down to the floor below in pipes fixed in chases in the walls. On the basement floor cross-channels were avoided as much as possible. In the lecturer's experience wooden sinks are far the best, provided that they are built up solidly without dovetailed joints, and that they are always kept partly full of water by arranging the waste so that it projects several inches (about four) above the bottom of the sink. American white wood seems to be one of the best to use. Sides and bottom should be without joints. All surfaces should

* See our issue for January 3 for illustrations of this building.

be well painted with thin coal tar before they are butted; and the whole surface inside and out should be similarly coated. The waste-pipe should either be somewhat expanded or should have a flange burnt on by means of which it may be held in position by two blocks, one of which—fixed by screws to the under side of the bottom—serves to carry bolts by means of which a second block is caused to clamp the pipe firmly. The space between the pipe and the side of the hole through which the pipe passes is filled in with pitch. The sink is wedged up against the bench top. Such sinks may be made of any size that may be desired, and no plumber is needed to fix them. As regards benches, the lecturer advocated some such arrangement as had been carried out at the Christ's Hospital Girl's School, Hertford, in the new science room (of which a plan was shown) designed by Mr. Stenning—about the simplest and most common-sense plan, he said, that could well be adopted.

The author thought that in future it would be possible to improve considerably upon the arrangements which had been made in the Christ's Hospital Schools, especially in the direction of simplification, by taking carefully into account the character of the fittings to be introduced at the time of designing the building. The ideal to be aimed at was to have the whole of the room, both floor and wall space, available for the work to be done in it. Wall space was invaluable for many mechanical and physical experiments, for blackboards, for shelving, &c. Benches, therefore, should not be fixed permanently against the walls, but should be placed out in the room. Projections into the room should be avoided, and windows be inserted at least 6 ft. above the floor.

Whenever possible, steam or hot-water pipes for heating the room should be carried under gratings in channels in the floor. Radiators, &c., take up much space, and interfere with and damage fittings in their neighbourhood.

The lecturer questioned the need of the elaborate provision hitherto made for benches. If sufficient shelving, racks, &c., be provided, and cupboards for general use where necessary, there is little need for cupboards under the benches. He favoured steady, heavy benches of the kitchen-table type. For such benches it was unnecessary to use hard wood; all difficulties of staining, disfigurement, and cracks would be overcome by the use of lead-covered benches—a long experience had led the lecturer to prefer these to all others.

With reference to girls' schools, briefly touched upon by Professor Armstrong, he advised that provision should be made, even in the case of girls, for some use of tools. Men had long been victims of academic prejudices, but were seeking to throw them off; the disease was now being contracted by women, and we had to deplore the all too literary bent of the curriculum in girls' schools, whether primary or secondary. By making liberal provision of space for domestic workshops, the architect might do much to turn the tide.

With regard to the treatment of wall space, as much as can be spared here and there should be properly prepared, so that it may serve as a blackboard; or the special black canvas, so much used in America, should be fixed against it by battens. Wherever there is spare space, stout battens should be fixed to the wall a few feet apart—when these are provided brackets may be fixed up at any time.

With reference to the science workshops in colleges as distinct from those for schools, in minor matters these differ considerably, but in principle they are very much alike. The lecturer observed that if he were called on again to design a laboratory, he should greatly simplify the fittings and follow as nearly as possible the model of the well-arranged factory.

The rules with regard to planning and fitting public elementary schools recently issued by the Board of Education, undoubtedly tend to favour over-provision. It is not merely that much more money is spent than necessary, but a false complexion is put upon the work—it becomes drawing-room practice and not workshop practice, and when scholars go out into the world, they find themselves placed under altogether strange conditions, unable to use the ordinary tools, and unable either to fit into or to follow the ways of ordinary life. The outcome is most serious; some action must be taken to put the schools on a simpler footing and to bring their work into harmony with ordinary requirements. In conclusion, Professor Armstrong urged that some attempt should now be made to standardise the requirements, both for elementary and secondary schools.

Sir Wm. Abney, in proposing a vote of thanks to Professor Armstrong, said he felt very diffident in an assembly such as that in saying anything regarding science fittings. He must, however, take credit in one way, for he believed he was the first one who ever thought out any fittings at all for the laboratory. More than thirty years ago it was his duty to teach chemistry and physics at Chatham, and when he went there there was no laboratory of any description except a rough shanty kind of place, and he had to get out a plan of fittings. With the help of Mr. Valentine he got out designs of laboratory fittings. He could not say that they were perfect by any means, but, at all events, they were good of their kind at that day, and it must be recollected that at that time there was a great deal of chemical analysis taught, but very little of the other part of chemistry which was now found to be absolutely necessary. The pupils he had to deal with were of a very varied description. They began with the bugler and ended with the Colonel; so that one had to provide laboratory accommodation which would suit all classes of men, and one had to guard, for instance, against the possibility of the bugler squirting nitric acid into the Colonel's eye from the opposite side of the bench. In connexion with that point he could not help feeling that the position taken up by Professor Armstrong as to what he called the "top hamper" bench was somewhat severe. He considered that they were necessary to avoid danger, for he knew that accidents had occurred on several occasions. Thirty years ago no laboratories existed except in large towns, and, when he came into office in the Science and Art Department, they had only a few laboratories which he had to inspect; but he had lived to see at least a thousand laboratories all over the country. His first duty when he came into office in the Science and Art Department was to get out some kind of working-drawings by which people might make plans for the fitting-up of the laboratories, and they took as a model those he put up at Chatham, with the modifications afterwards introduced. Professor Armstrong had recognised that where they had advanced work to do, they required a certain amount of water to be available close to the benches. In a secondary school such as Christ's Hospital, of course it was perfectly possible to have two or three sets of laboratories—one for the elementary, one for the intermediate, and one for the more advanced—but in the laboratories which he had to inspect, and with regard to which they came to the Department for advice, it was impossible to have more than one laboratory, and so they had to make the best of both worlds. They had to provide for advanced instruction and for elementary instruction, and at the time it was thought better that there should be this supply of water to the benches. Those abominable two sinks, which had been so well condemned, were developed at a time when, like all things in ancient history, they seemed to have their value in the eyes of modern science, as they did in the days when he was young. With regard to the science branch, the Department of which he happened to be the head was not so stringent with their rules regarding the equipment of laboratories as they used to be. All they wanted to see was that they had a little more than the rough kitchen tables spoken of. They preferred to see something for their money. In the old days the Government used to give grants in aid of laboratories, and, of course, they always liked to see something tangible. Now the days of giving grants were passed, and therefore they gave much greater freedom than in the old days. He was not responsible for the elementary education, but he did think that Professor Armstrong had been a little too severe upon the Board of Education. He knew that Professor Armstrong was not imbued with a great liking for the Board or its ways, but at the same time let them give the Devil his due. The rules said that the science room was to be a room suitably fitted for elementary practical work, and might be provided for the use of one large or several preparatory schools. It was not to contain more than 600 ft. of floor-space and was to be fitted with strong and plain tables, sinks, closets, &c., and, in addition to the science room, one ordinary classroom was to be fitted with a demonstration table, gas and water supply, &c. Those were the whole of the conditions which were required for the public elementary school. When they came to the higher elementary school the conditions were that higher elementary schools should be provided with suitable laboratories. He thought it was a good thing that higher elementary schools must be provided with laboratories of some kind. At the same time he would say that the word laboratory was a very much misplaced word, for it really appeared to mean more than was intended, and he preferred Dr. Armstrong's expression, "workshop." That meant the same thing, but, of course, it sounded more pedantic and pretty to call it laboratory. Then with regard to the rules which had been criticised, one was that laboratory accommodation was to be provided at one time for the largest class in the school, and he did not think that was bad. Next it was laid down that generally there should be one laboratory of chemistry and one of physics, and he did not think badly of that. Then there was to be thirty square feet of floor space for each scholar, which appeared to him to be an ordinary essential. Another rule was that the laboratory was to be fitted with suitable tables—they did not say what tables. Then it was said the laboratory was to be well lighted and properly supplied with gas and water, and that there should be a small balance-room if desired. Further, the room was to be fitted with a demonstration table and so on. He thought these requirements perfectly carried out Dr. Armstrong's idea as to what a workshop should be. He was not responsible for the rules, but he did say that the utmost freedom was given to architects for anything they liked to propose, and he was quite certain that the Board of Education would not object to anything in reason. He had already mentioned the benches, and what Professor Armstrong called the top hampers, and he demurred at doing away with the top hamper. He had dealt with all kinds of students, and had had thirty-seven years of teaching, and would only say, personally, that he would not have been without protection for the eyes on any account. He knew from experience that had work been done at the tables without that protection very serious accidents would have taken place. He felt that one of the people whom Dr. Armstrong had to include in his crusade was the apparatus maker, for he believed that he was responsible for a great deal of the defects of present fittings. If Professor Armstrong would only make a crusade against the apparatus maker he would do a good work for science. He wanted to ask one question: Could the sinks Dr. Armstrong had shown be emptied, and was there always standing water in them?

Professor Armstrong: There is always standing water in them. That is the purpose.

Sir Wm. Abney thought that sometimes the sinks would be overcharged with noxious matter, which would be very disagreeable. Otherwise he thought the wooden sink was admirable, for it was a good plan to collect the heavy sediment at the bottom rather than sending it down the drain pipes. He quite agreed with the reader of the paper as regarded the flues. In conclusion Sir Wm. Abney congratulated Professor Armstrong on his address and thanked him for the admirable pictures shown on the screen relating to Christ's Hospital, with which the President was so intimately connected.

Mr. W. D. Caroë, in seconding the vote of thanks, said he was sure it was a very great pleasure to have been able to see on the screen some of the inner workings of that very fine block of buildings which had been erected at Horsham. It had been his privilege, under the guidance of their President, to have had explained on the spot and to see there the fittings about which they had had so very clear and explicit a statement that evening. What struck one most in regard to those fittings was their great simplicity, and they would certainly owe a debt to Professor Armstrong if he could in any way induce others in the same position as himself to lighten the burdens of architects who had to cater for the extraordinary elaboration of modern science-room fittings. In fact, he could conceive nothing that could be better received amongst architects as a body. At the same time he was bound to congratulate the President very heartily on hearing from Pro-

fessor Armstrong that he was in a position to design the building without consideration of the fittings in the first instance, and it was a great triumph to his foresight and prescience that everything had turned out in the admirable and appropriate way in which it had. He (the speaker) was in the rather invidious position of having to criticise the buildings designed by others, and in order to qualify himself to do that he had consulted many science teachers and visited a great many laboratories with a view of finding out the best thing to be done in the various fittings, and the great difficulty he had been confronted with constantly was that every science teacher had always told him that the way the other science teacher was doing the thing was not the way he liked. In criticising other people's fittings, he nearly always found they came before him in a very different form to attain the same result, and when he ventured to make some suggestion he was generally told that South Kensington recommended the course taken, and therefore he presumed that the recommendations at South Kensington were not so standardised as Professor Armstrong thought they ought to be. Professor Armstrong had set the subject before them in a most admirable manner. He had recently been studying from time to time, and had been much interested in, what might be called the politics of modern education. They had had a series of letters in the *Times* on the advantage or otherwise of learning Greek in their schools and universities, and he had a sort of fellow feeling for the more literary methods. On reading the first page of Professor Armstrong's paper he felt a little alarmed, but he was conciliated on the second page, because there Professor Armstrong treated the subject purely from the point of view of education, and it was not treated with a view of those who were studying these various scientific requirements, so that they might become technical experts at an early age. However, that was rather dangerous ground for him to enter upon, but he could not help calling attention to the benefit of what Professor Armstrong himself called the literary side. He had already referred to Professor Armstrong's proposals to introduce simplicity, and he had no doubt in his own mind that space was a matter of very great importance, and they as architects, he was sure, would gladly provide far more space than they usually did in buildings of that kind; but Professor Armstrong must remember that, to a certain extent in regard to that, funds were limited. He would like to ask a few questions, because he hardly felt in a position to throw any special light on that subject. Professor Armstrong had referred to the balances being in the centre of the room. He had been told by science teachers that the balance-room should be so placed that the fumes from the laboratory could not reach it. Again, with regard to sinks, he was sure Professor Armstrong was right about the use of wooden sinks. He had examined various classes of sinks—earthenware and lead sinks, and had even seen enamelled iron sinks, which would, of course, lead to disastrous results. But he believed that at Cambridge Professor Living had preferred to use earthenware sinks, and he believed it would be found there that in a good many instances they had lost their glaze, but Professor Living said it did not matter—he only wanted a substance which was quite impervious. The question of aspect also suggested itself to him, and it was one which they as architects, who were not chemists, should be enlightened upon. He noticed, for instance, in one of the drawings that some of the girls faced one way, some another, and others a third way. Now there were only four points to the compass, and one of those ways must be a way which might not suit all technical teaching, and therefore he would venture to question the arrangement which they saw before them in several respects, although he did so with bated breath, as one of the plans, he believed, had once passed through his hands. The question of ventilating was again one for deep attention. They would probably remember the unfortunate accident which happened at Cambridge a year or two ago, where a professor was doing an experiment and was killed. It was suggested that the accident occurred from the fact that the fume closets had a little gas jet in the outlet, and the fumes from the experiment he was doing ignited and blew the whole front of the fume closet into his face. That suggested at once that the use of gas in such a position was one to be avoided. At the same time, when they came to consider electricity as a substitute for gas, they met with difficulties, because any one who was acquainted with an electric motor driven by the alternating current knew the noise it made. That was a strong reason against the use of the alternating current altogether, because there was no doubt about it that the electric motor would come more and more into use, but the use of the direct current was unfortunately more expensive. He would like to ask Professor Armstrong one more question, which was as to his view of placing the fume closets in the windows, which ten or twelve years ago was a very favourite arrangement, and one of which he had heard spoken very highly. Of course, there was the great advantage that there was no lack of light to see everything going on in connexion with the experiments, and it certainly was a very convenient way of disposing of the fumes if the windows could be brought within 3 ft. of the floor. On the other hand, of course, they lost a large amount of wall space which was very valuable. One of the inferences which Professor Armstrong had suggested was the obliteration of the sink from the working table. He could quite conceive that was a matter which might be very suitable in the elementary classes, but he could not help feeling that in the colleges there might be another aspect of the question. One of the most interesting laboratories he knew was one erected by Mr. Waterhouse at Liverpool. He believed it was called the Practical chemistry laboratory. It was in the form of a theatre, where there was a working-table for the demonstrator, and every row of the theatre was occupied also by working-tables for the students, and the same experiment could be carried out by every one in the room at the same time. Of course, in cases of that kind, and also in cases of examination where moving about to a large extent might be awkward, it seemed that the provision of water in the working-table was one that could hardly be avoided. If Professor Armstrong could show how it could be avoided under such circumstances he for one would be extremely gratified, for the difficulty of dealing with the water and getting it away, and providing sinks and so on which would not be acted upon by the chemical fumes was a very great difficulty.

Mr. J. Slater said he thought the paper went to show the necessity for scientific and technical education being given at a very much earlier age than used to be the case There was one remark not altogether germane to the subject of technical education which fell from Professor Armstrong, which he would like to refer to. Professor Armstrong said that although it was not his province to consider ornamentation, yet he would venture to urge that money spent on ornamentation would be always well spent. He considered that a remark which could not be too widely set forth. As they all knew, in London and in all large provincial towns they had a number of Board Schools, admirably built in all respects, and yet the interior aspect of the classrooms was of the barest possible character. In the same towns they had art-schools doing admirable work, and why should not the municipalities endeavour to get these art-schools to do something for the ornamentation of the Board Schools. That would be of the greatest advantage to the Board School, and of equal advantage to the art school. With regard to the many technical details which had been touched upon by Professor Armstrong, the question of sinks was a very important one. It was a curious thing that, although for centuries the ordinary washing-tubs were made of wood and nothing else, yet, until quite recently, no one seemed to think of using wood and wood only for sinks. There was no possible doubt but that it was the best material. Another matter which Professor Armstrong mentioned was that of blackboards, and there, again, there was no doubt he was right in saying that the ordinary small blackboard was practically useless in any classroom for teaching purposes. In a large school with which he had something to do he had the whole of one end of the room covered with cement with a very fine face, and had it blacked, so that the whole end of the room could be used as a blackboard, and that answered very admirably. There was one other question, viz, that of warming classrooms and schools. There could be no possible doubt that radiators were a great mistake, and the only possible course to warm the classrooms or school was to have the underground passages with gratings over them. The question of ventilation had, of course, been enormously affected by the use of fans driven by electric motors, and the question of alternating currents would not come in, he imagined, where a school had its own installation. It was only where companies supplied alternating currents that the difficulty occurred, and even then there was no great difficulty in transforming the alternating currents into continuous currents.

Mr. J. J. Stevenson said perhaps he might give a little experience he had had of building laboratories. It was a good many years ago now since he was appointed to build Professor Living's laboratory at Cambridge, and his experience with him and in other cases would be to recommend any architect who had such work to do not to go to it with any preconceived notions. Professor Living had been a long time waiting for his laboratory, and he had accumulated a mass of data as to what he wanted. He showed him a plan and rough elevation, and amongst other things he wanted a factory chimney 100 ft. high. He (Mr. Stevenson) asked if he minded the chimney being square, and he did not. At first he thought of making it like a tower, but afterwards thought it would be best to make it a good honest chimney somewhat ornamental. Professor Living also wanted the door at one side, but when asked if he minded having it in the centre, he had no objection. He considered his function was to carry out what Professor Living wanted, and put it in proper architectural form. They had little difference as to what should be done. Professor Living wanted the great squares in the windows to be filled in with sheets of plate glass, but the design had been for small panes, more like an ordinary workshop. They went into the matter, but it did not seem worth while to take out the panes. With regard to the ventilators in the chimney, he did not know how far it worked. Professor Living found no fault with it, but he had no doubt that a new professor coming would wish to make a great many changes and improvements. They had a pretty elaborate system which worked very well, which carried the ventilation along the ceilings of the room to the great chimney. Professor Living insisted as far as possible in getting big rooms with windows opening on two sides, so that they could have a draught across the room. With regard to the use of wood for troughs, in the Morphological laboratory at Oxford, where small dissections were made, Professor Ray Lankester suggested, and there had been carried out, a continuous trough in front of the benches, with slight slopes, which were intended to carry and clear out the remnants from dissections. He believed that system had worked very well. He would like to make a remark with reference to the observation Professor Armstrong made to the effect that it was extremely unlikely that women would have anything to do with what was called jobbing work. He knew a young lady who was with Miss Dove at High Wyckham, where the girls were taught all sorts of useful handiwork, and they did not need to go outside the school to get a window mended or anything of that kind, and many of the girls who passed through the school were most useful in doing little jobs of that kind.

Miss Walter remarked that she had brought the architect's plan of the new buildings of the Colston Girls' School, Cheltenham, which had been passed by the Board of Education. There were two large laboratories—one designed for physical work and the other for chemical work—and they were both identically the same in construction. There were four long benches 14 ft. long with a gangway between them of 4 ft., and a demonstration bench at the end. The room was 32 ft. by 26 ft., and was to accommodate about twenty girls, which was the largest number of girls, she held as teacher, would be able to see properly and who would at the same time be able to see the teacher. In this room there was a set of benches, and the balances were put along the benches and covered in. There was a small extra room, which was partly to be used for a preparation-room, and also was to be fitted with a carpenter's bench and so on. In the old days students who did scientific work were not younger usually than sixteen, but nowadays they were taken at twelve, and sometimes younger, and these young students required to be well looked after. In that room she

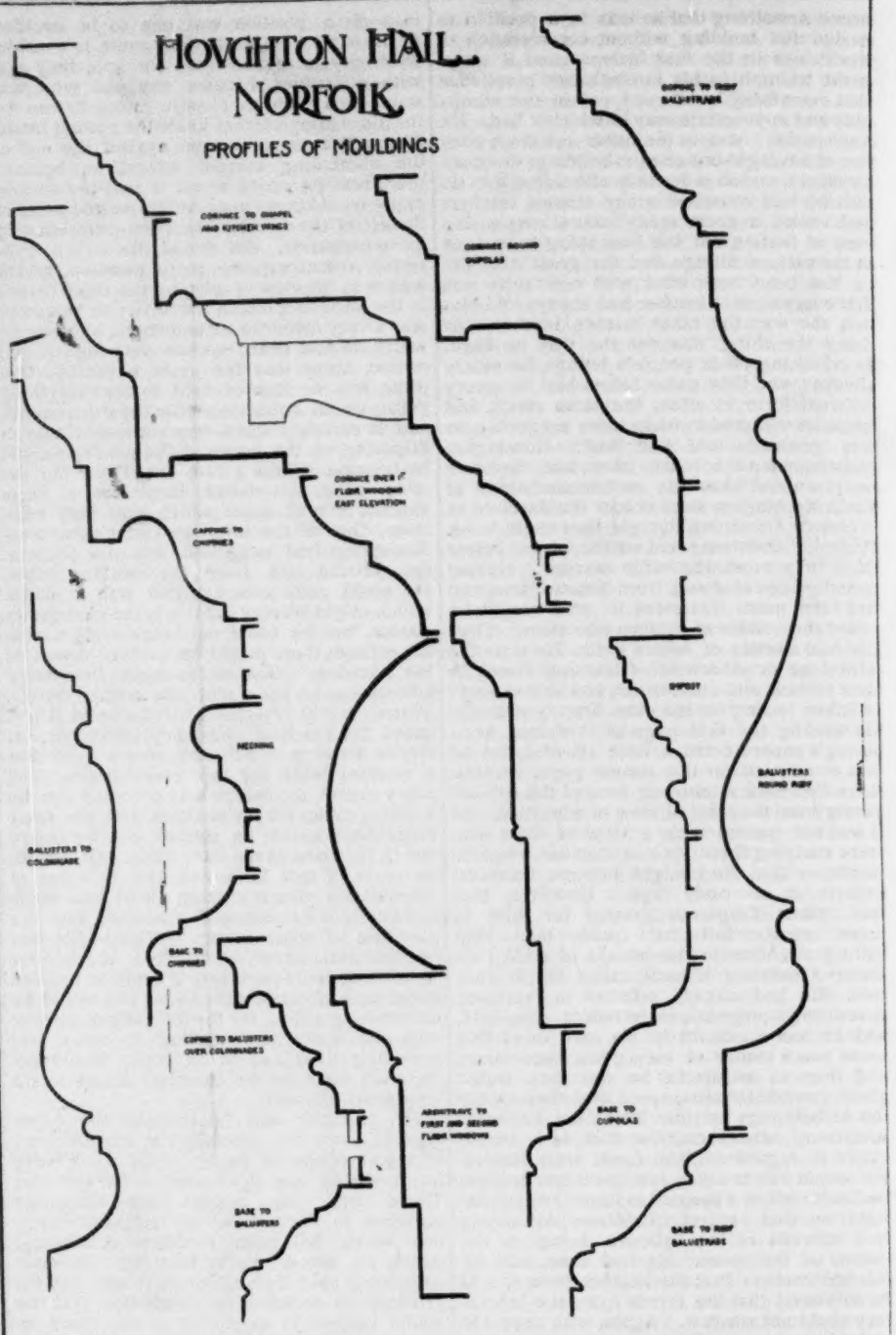
had spoken of, the girls worked only from one side of the bench, and that was also carried out in the girls' school at Hertford; and in the plan she had, every girl would face one way, and that got over the difficulty and danger of squirting things into another's face. Really the main point about the laboratory was that the benches were only half as wide as usual and only faced one way.

The Chairman said he felt he ought to say for himself personally that when Professor Armstrong undertook to read a paper on the subject he did not know he was going to make the schools at Horsham the principal illustration of the lecture. With regard to the laboratories, it was quite true that they were not built to suit Dr. Armstrong's arrangements in the first instance, because there was at that time a science teacher there who had different views. When the building was nearly up to the first floor, very fortunately the Royal Society appointed Dr. Armstrong as one of the governing body of the Hospital, and they then altered the internal arrangements of the buildings completely, to meet the views of Dr. Armstrong, and he was quite sure that the Hospital owed a very deep debt of gratitude to him for what he did in modelling those rooms. Of course in a case of that sort the architect really had but a small work to do. The architects were responsible for the position of the science school, and gave it an importance in the general block which, as Dr. Armstrong had said, had not generally been given, for, as a rule, a science school was stowed away in the least noticeable part of the building. But after that was done the work almost entirely fell into the hands of Dr. Armstrong. All the fittings shown there were, of course, carried out entirely from Dr. Armstrong's instructions, and the architects merely acted as draughtsmen to carry them out. The great change which was made was that the class-room and lecture-room previously provided were swept away, and the large laboratories took their place. As a matter of fact, in this particular school there was no lecture-room. It was all class-rooms and workshops. With regard to the fittings, and especially the sinks, he happened to have had a good many fittings to do under different professors at other places, and he had been much impressed with the enormous use that was made of tar. The great thing in these science fittings seemed to be tar. They liked to tar the sinks inside and out, and the drains also. There were cases where they tried to make the joints of drain pipes a mixture of tar and sand, and it seemed to be less affected by acids thrown down them, and it was extremely simple and inexpensive, and the plumber had nothing to do with it. With regard to the heating of these laboratories, he did not agree with Mr. Slater that pipes under the floor were best. He thought they should be brought above the floor, and he was inclined to think that a system of warm air admitted under slight pressure was the best means of heating, because it disposed of the difficulty of hot and cold iron, which, in science laboritories especially, was a great difficulty. Therefore, they were obliged to have copper, which became expensive. At Horsham, where the buildings were of an extended character, and so scattered, it would have been impossible for them to have successfully adopted the plenum system.

The vote of thanks having been heartily agreed to,

Professor Armstrong, in reply, said that it was to him a peculiar pleasure that Sir William Abney had spoken on the matter because one knew what extraordinary services Sir William had rendered to the cause of practical work in the country. If he criticised the regulations of the Board of Education at all it was with the object of leading to some stopper being put on the enthusiasm of some of those who had to look after those fittings. Although, as the rules were interpreted by Sir W. Abney, there seemed nothing to object to, yet there was no doubt they had led to great expense. With regard to the balance-room they were told it should be so placed that the fumes could not enter it, but he would point out that however valuable the balance was the health of young people was as valuable, and he would not put young people into a place where the balance could not be put. The fume closets in the windows worked admirably in many places, but it was not required for the ordinary school work. As for sinks being required in colleges more than in schools, it was a question of fashion, and many of those points were entirely a question of fashion. He thought that if they had to have sinks at all they should be at the ends of the benches, and if any one wanted to see how simple and at what slight cost ordinary rooms could be adapted for this class of work, he would advise them to go the Central Foundation Girls' School at Spital-square.

The Chairman announced that the students' drawings would be on view in the Alpine Club-room up to the 31st of the month, and it was open to any members to go and see them. The next meeting would be held on February 2, when he would deliver his annual address to the students, and there would be a presentation of prizes. At that meeting also Mr. Millard would deliver a criticism of the designs and drawings submitted for the year's prizes and studentships.



Illustrations.

BUSINESS PREMISES, FLEET-STREET.

THIS building has been specially designed to meet the requirements of the London premises of the *Birmingham Daily Post* and *Birmingham Mail*, together with a certain amount of extra accommodation, which has been arranged for letting. A quiet but strong type of Renaissance architecture has been adopted in the design in order to harmonise with and lead up to the beautiful spire of St. Bride's Church, at the end of the court, and at the same time to preserve the character of the better elements of the architecture of Fleet-street. For the same reason the materials are Portland stone in the upper part of the building and the lower story of granite.

The staircase is arranged in the centre of the block, and is lit both from St. Bride's-avenue and from an internal area which divides the building in the centre. There are well-lighted and convenient offices entering from the landings on each floor on either side of this area, together with suitable lavatories; and on the upper floor special accommodation is arranged for the telegraphic work of the paper.

Mr. J. Belcher, A.R.A., is the architect. The drawing was exhibited at last year's Royal Academy.

HOUGHTON HALL, NORFOLK.

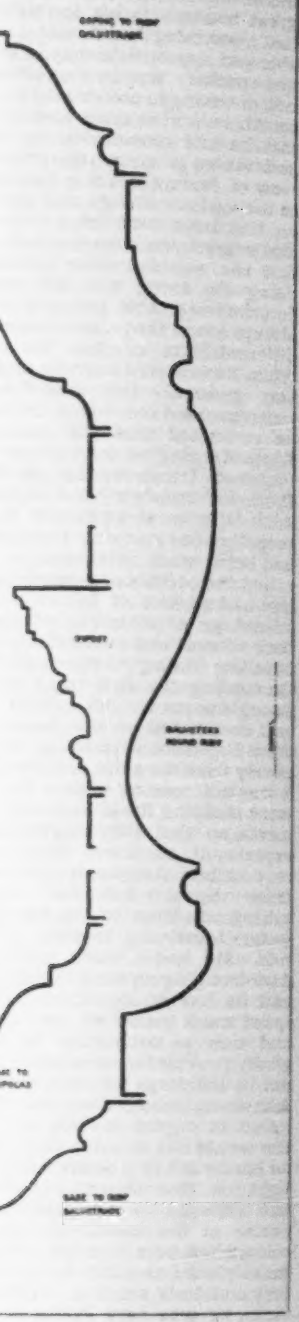
THE measured drawings of this rather celebrated house were made by Mr. Stanley Towse in competition for the Institute's prize for measured drawings last year.

The house was designed by Campbell for Sir Robert Walpole, in the early part of the eighteenth century, but is said to have been carried out by Ripley, who appears to have played some tricks with the design, in regard to which, however, we have only rather vague information.

The angle cupolas are rather commonplace in design, but the façade generally is a good

THE BUILDER, JANUARY 24, 1903.

BUSINESS PREMISES: 88 FLEET STREET.—Mr. John Belcher, A.R.A., Architect



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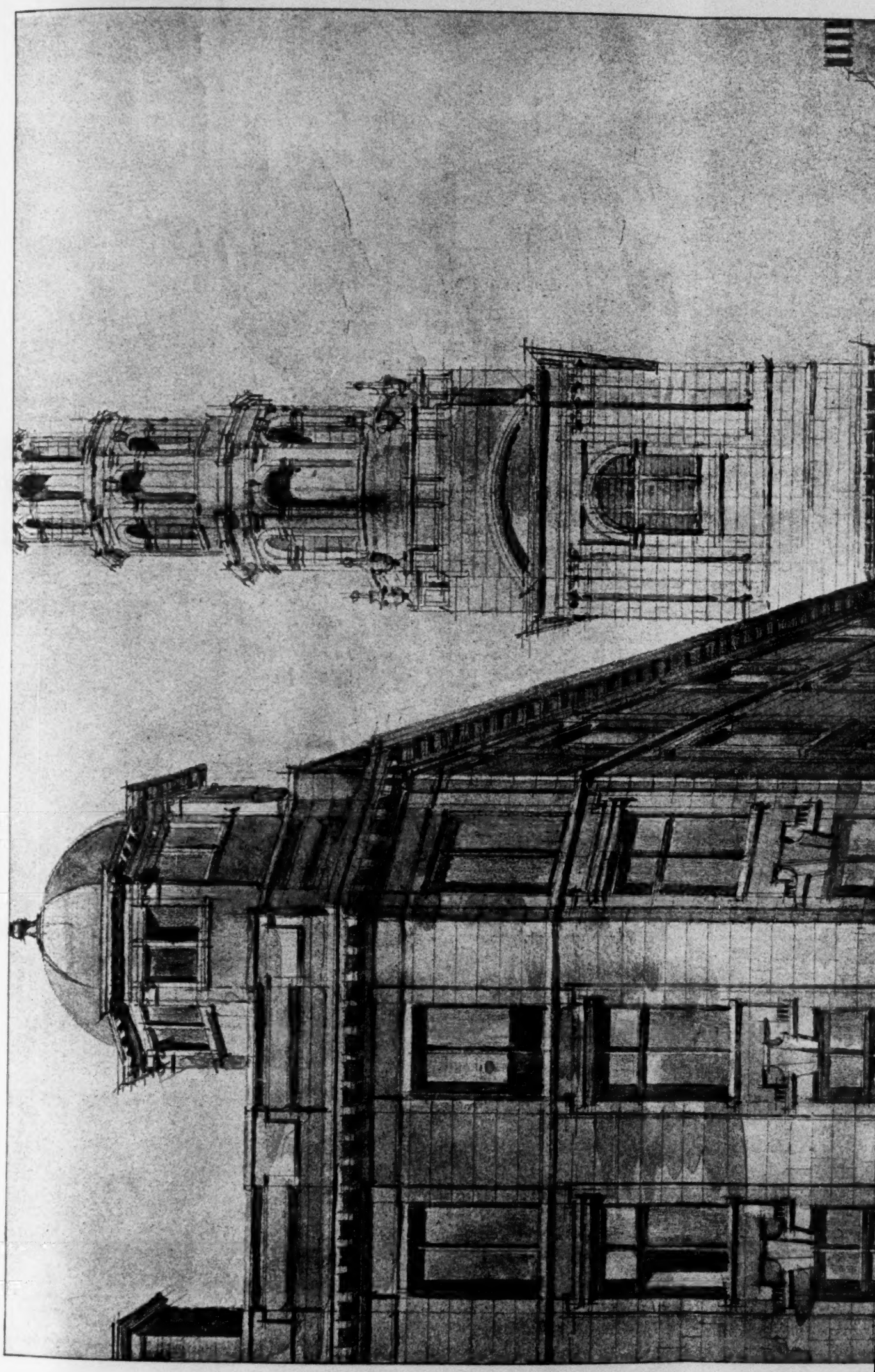
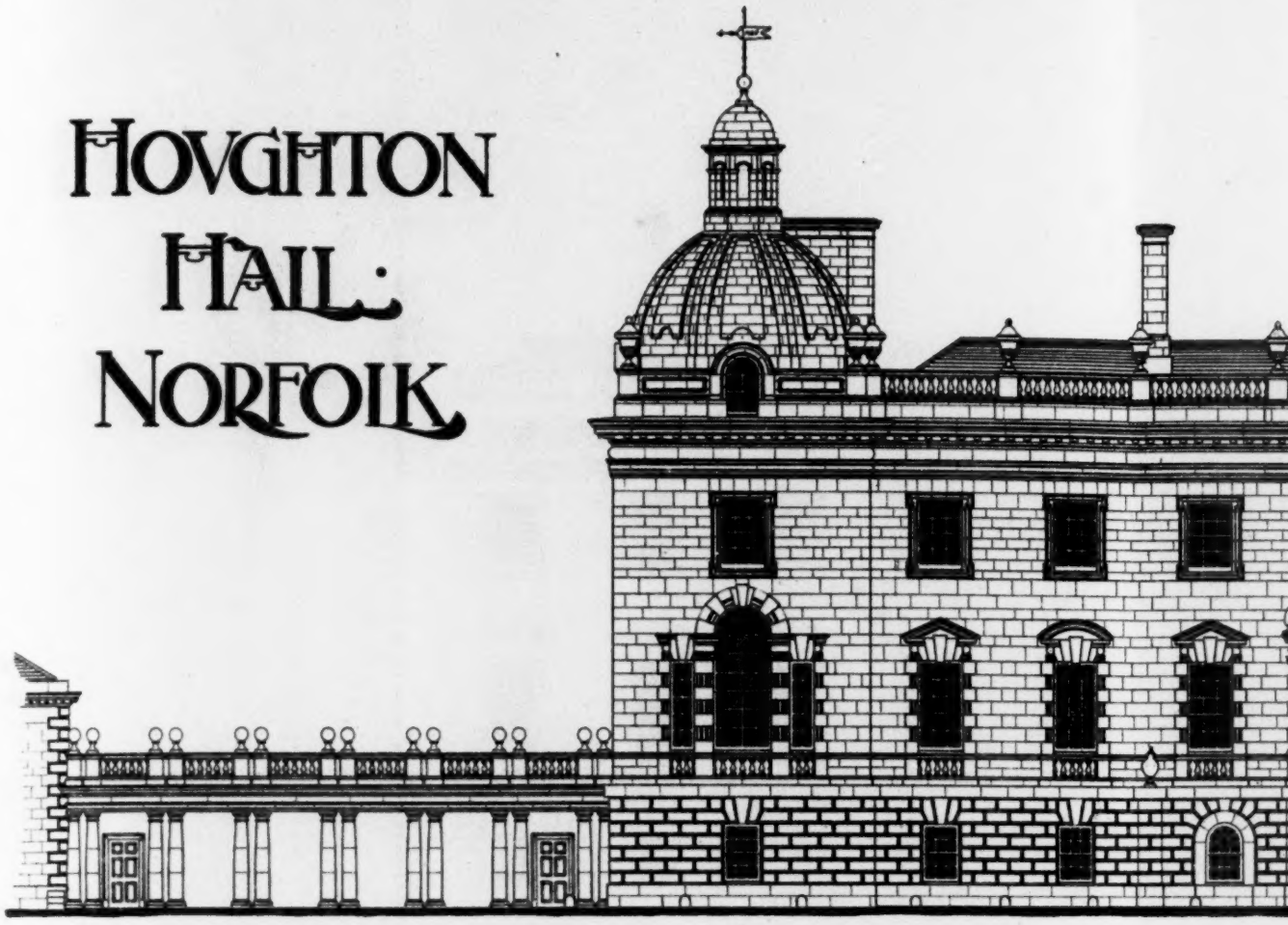


"INK-PHOTO" SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

BUSINESS PREMISES: 88 FLEET STREET.—Mr. John Belcher, A.R.A., Architect.

HOVGHTON HALL: NORFOLK.



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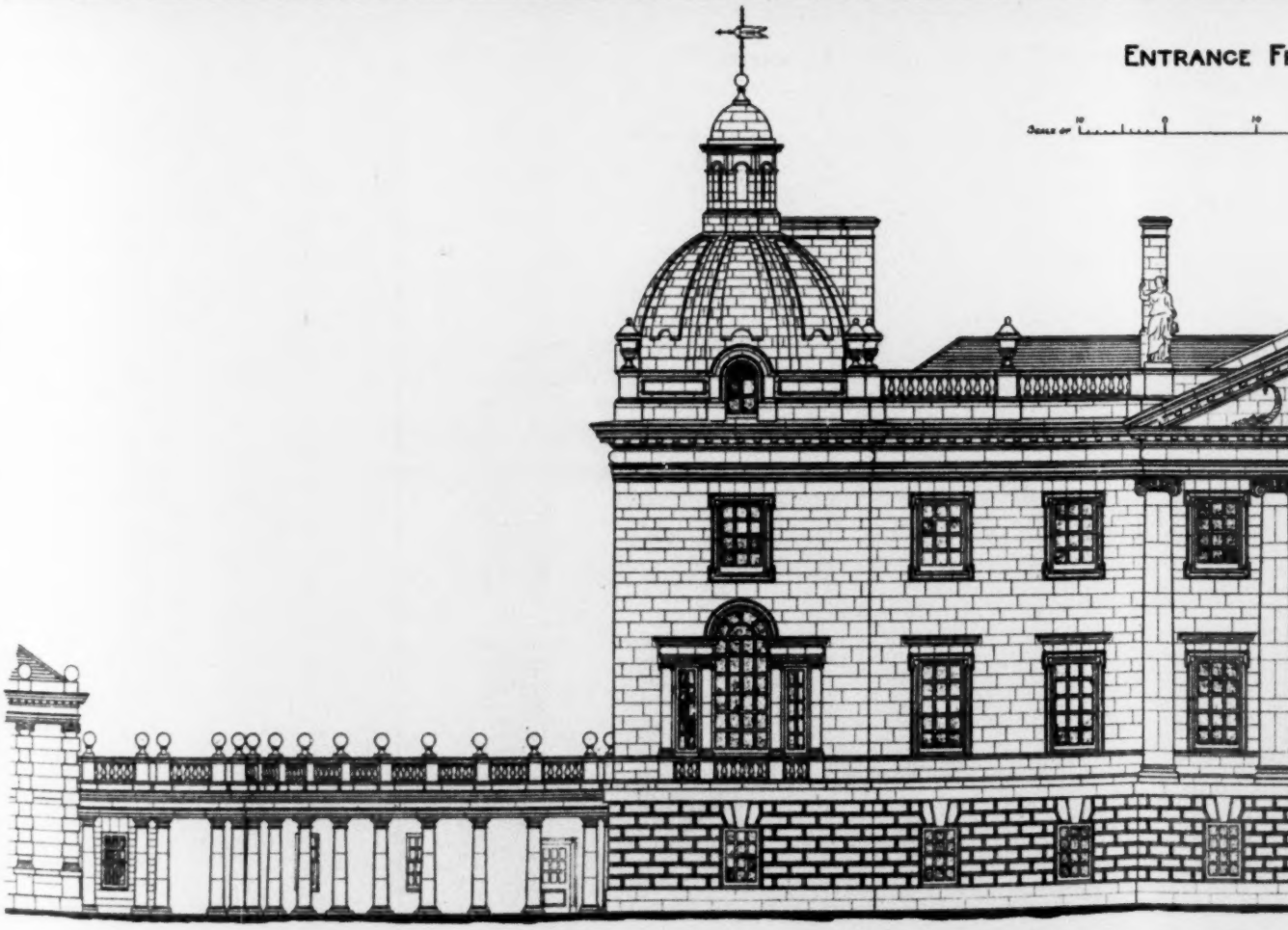

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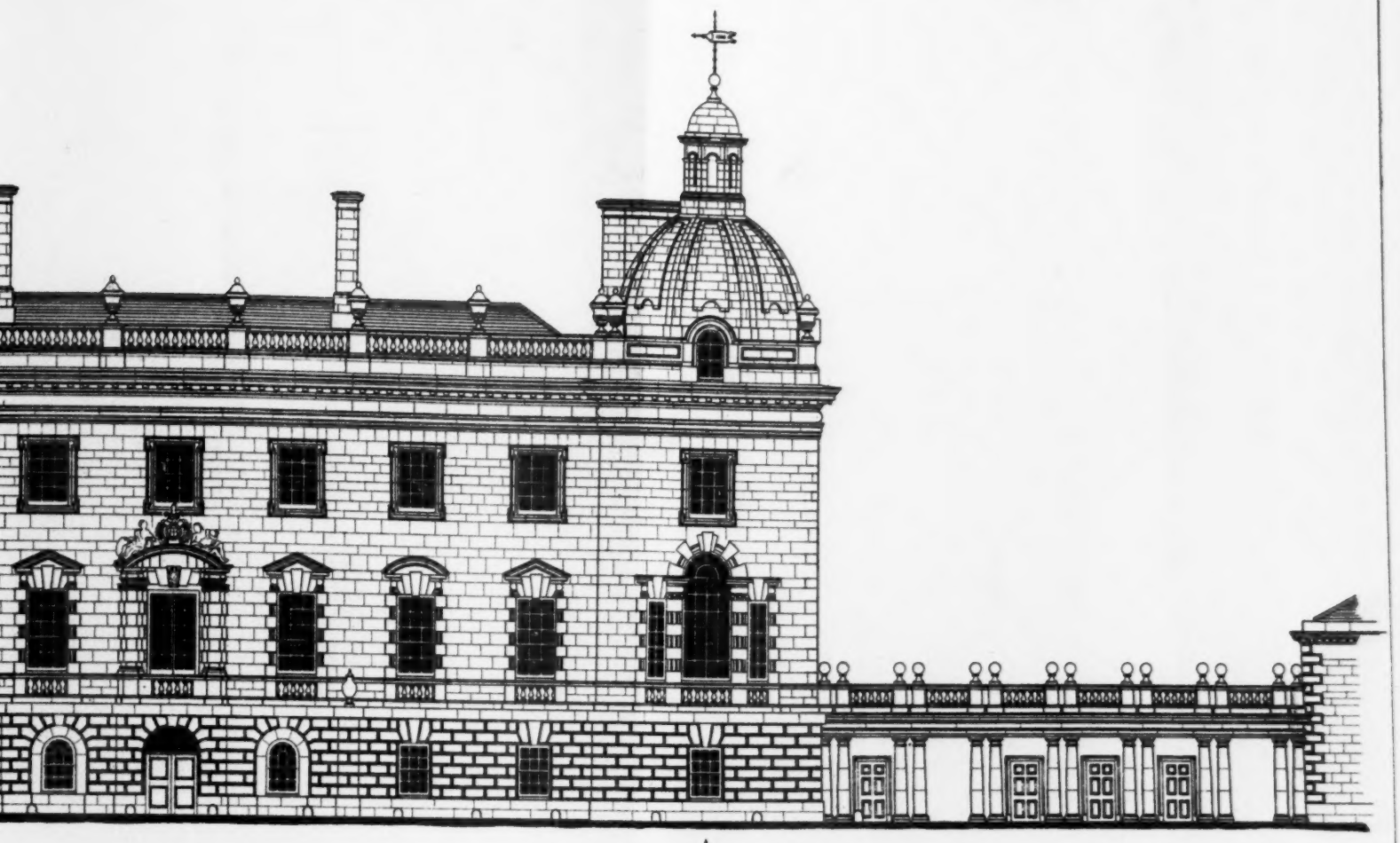
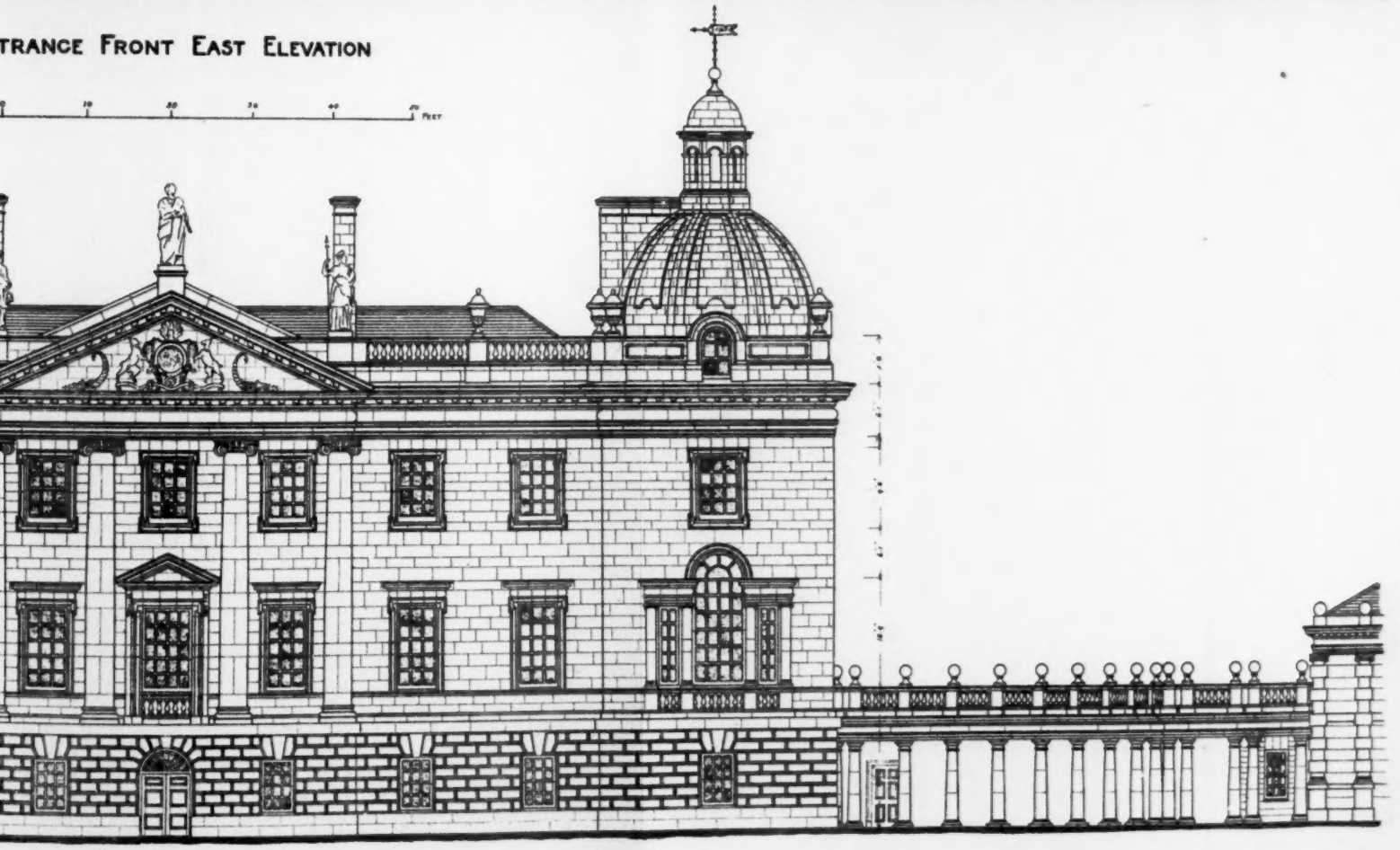


TRANCE FRONT EAST ELEVATION



RDEN FRONT WEST ELEVATION

Stanley Peach

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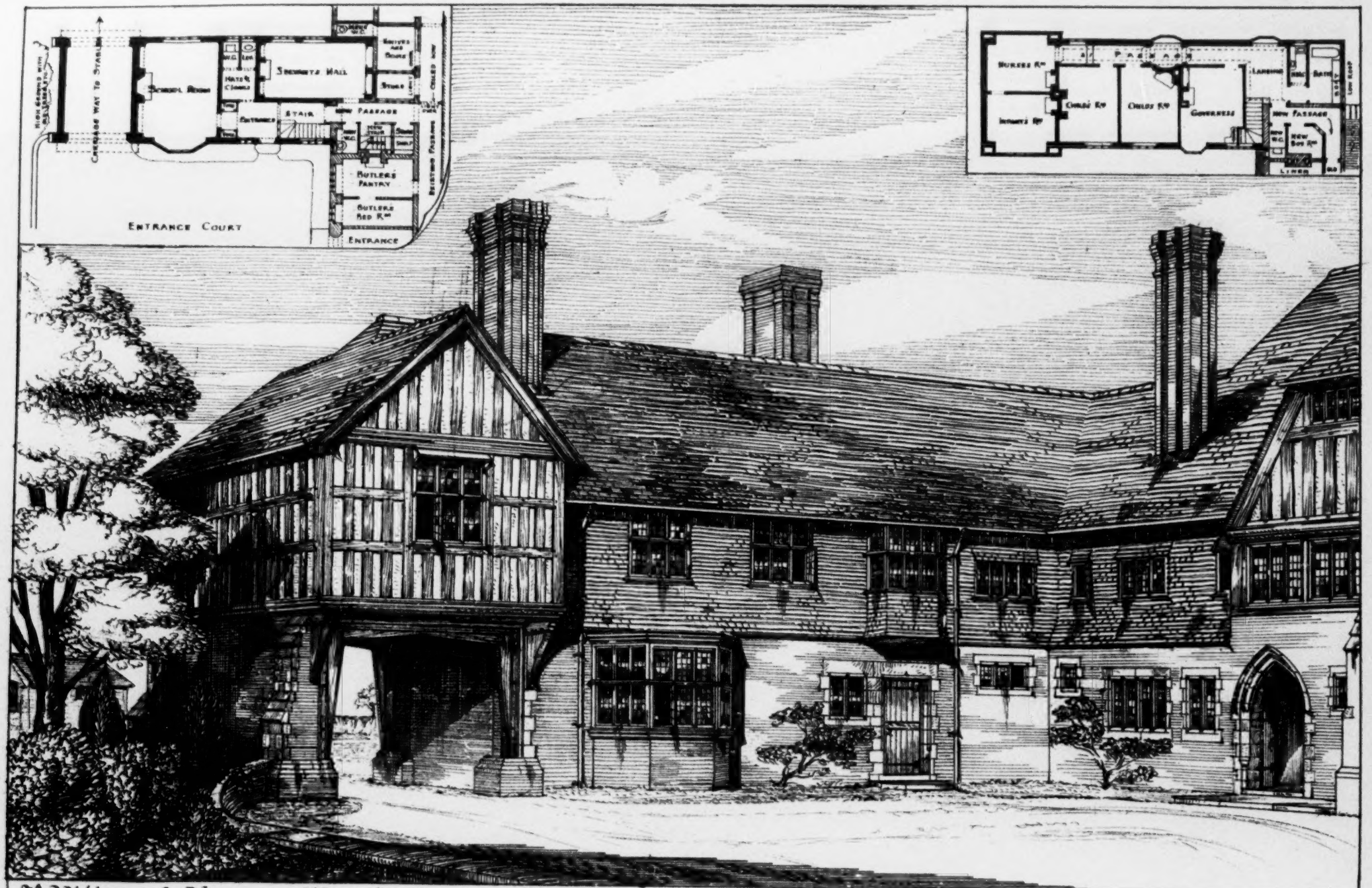

"Addition of Nursery Wing to Hopedene Surrey: View shewing approach from Stables to Drive: Percy N. Ginham Architect

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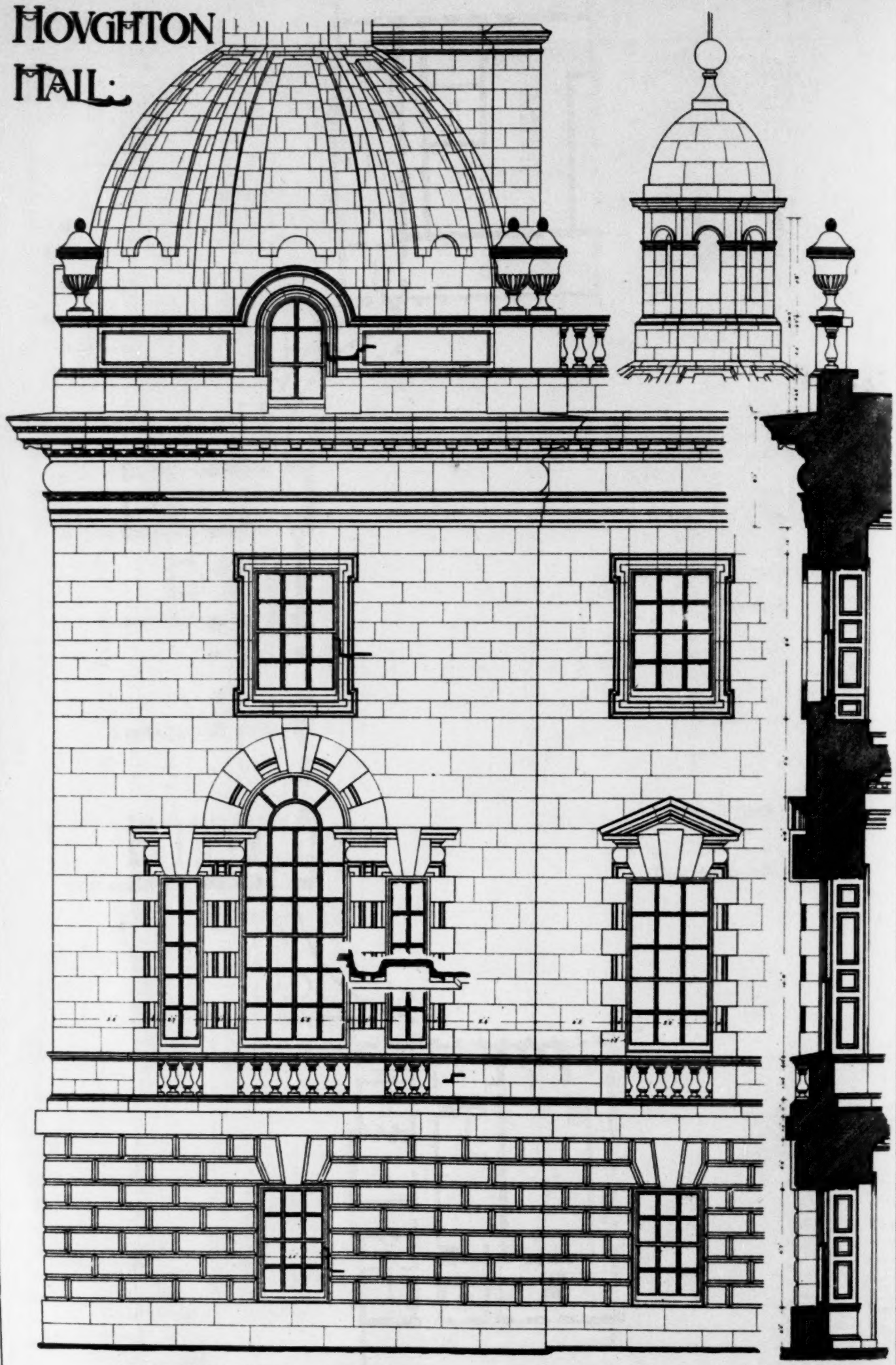
HOUGHTON HALL.



SOUTH EAST TOWER OF ENTRANCE FRONT

SECTION

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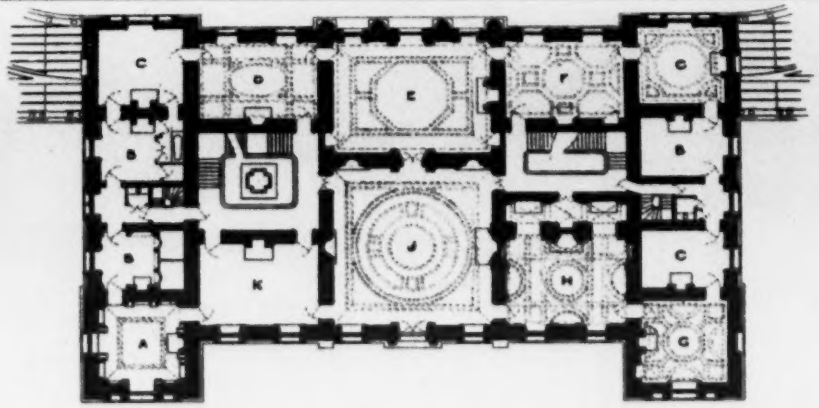
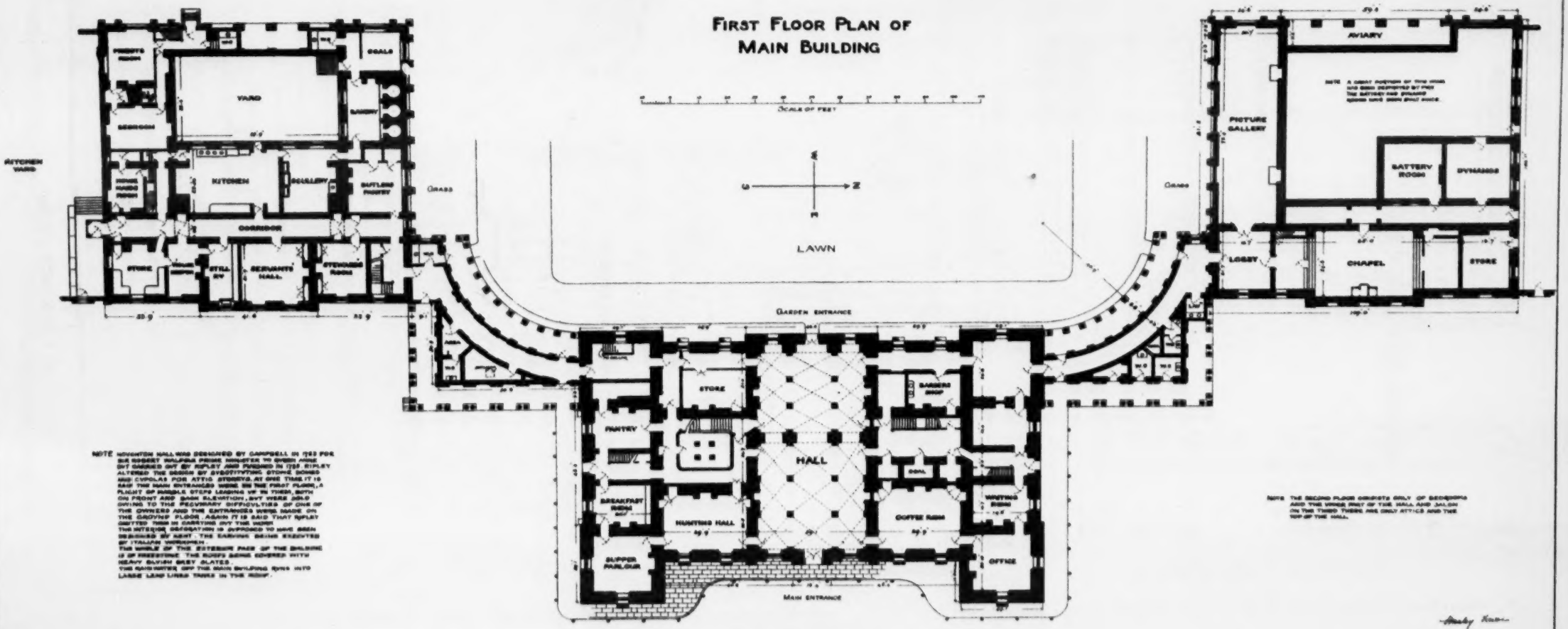
THE BUILDER, JANUARY 24, 1903.

HOUGHTON HALL, NORFOLK.



A LIBRARY
B DRESSING ROOM
C BED CHAMBER
D SOUTH DRAWING ROOM
E SALON
F NORTH DRAWING ROOM
G CABINET
H MARBLE DINING ROOM
J HALL
K BILLIARD ROOM

FIRST FLOOR PLAN OF MAIN BUILDING

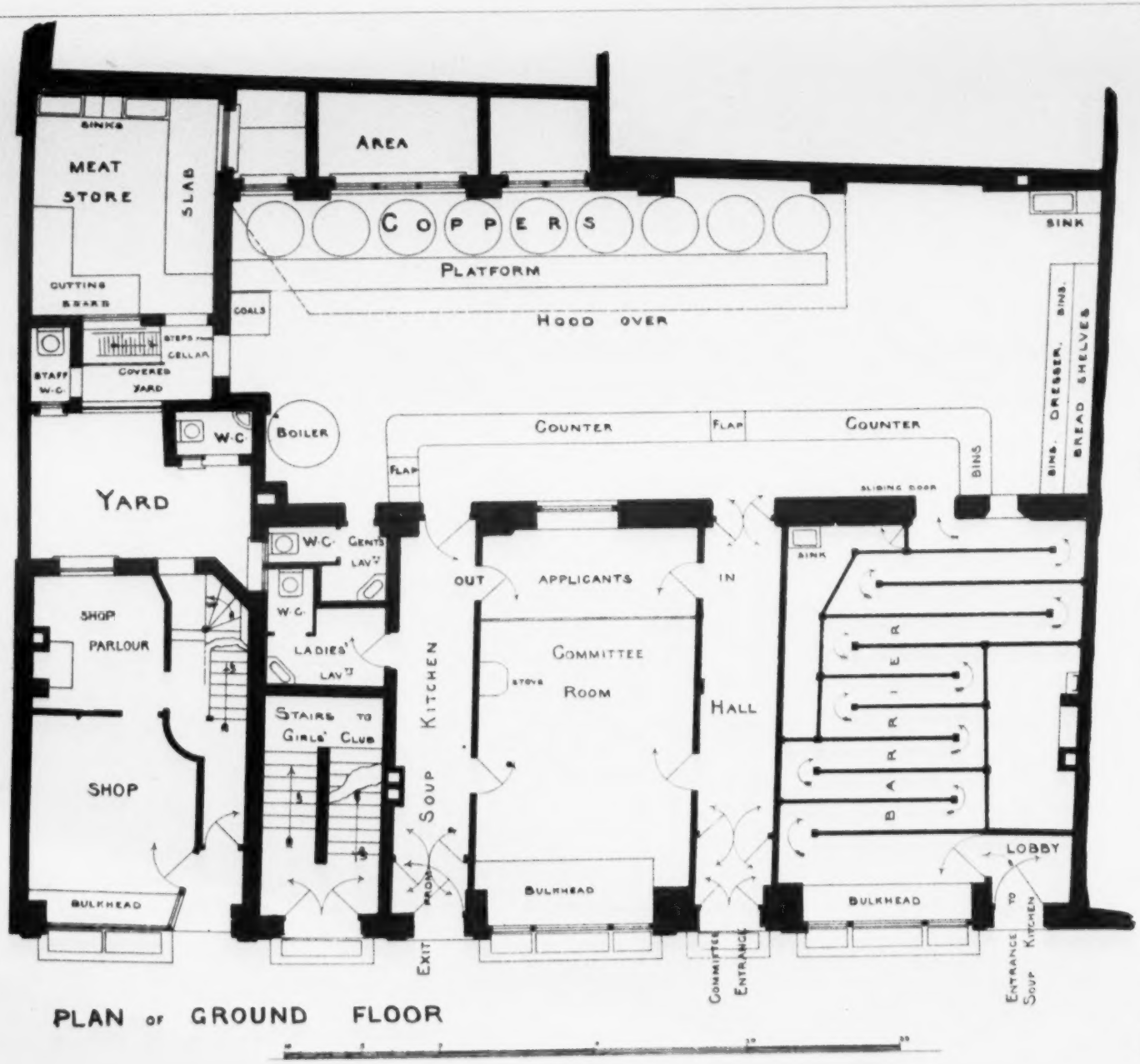


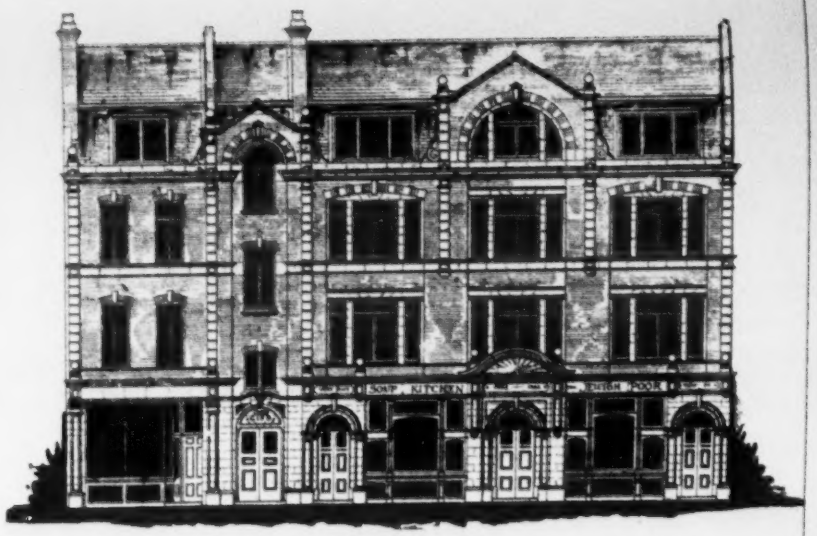
NOTE HOUGHTON HALL WAS DESIGNED BY CAMPBELL IN 1722 FOR SIR ROBERT WALPOLE PRIME MINISTER TO GEORGE I AND GEORGE II BUT BY RIPLEY AND FINISHED IN 1735 RIPLEY ALTERED THE DESIGN BY SUBSTITUTING STONE DOMES AND CUPOLAS FOR ATTIC STOREYS. AT ONE TIME IT IS SAID THE MAIN ENTRANCES WERE ON THE FIRST FLOOR, A FLIGHT OF DOUBLE STEPS LEADING UP TO THERE, BOTH ON FRONT AND BACK ELEVATION, BUT WERE LATER OWING TO THE PECUNIARY DIFFICULTIES OF ONE OF THE OWNERS AND THE ENTRANCES WERE MADE ON THE GROUND FLOOR. AGAIN IT IS SAID THAT RIPLEY OMITTED THIS IN CARRYING OUT THE WORK THE INTERIOR DECORATION IS SUPPOSED TO HAVE BEEN DESIGNED BY KENT, THE CARVING BEING EXECUTED BY ITALIAN WORKMEN
THE WHOLE OF THE EXTERIOR FACE OF THE BUILDING IS OF FREESTONE. THE ROOFS BEING COVERED WITH HEAVY DUTCH GREY SLATES.
THE RAIN WATER OFF THE MAIN BUILDING FALLS INTO LARGE LEAD LINED TANKS IN THE ROOF.

NOTE THE SECOND FLOOR CONSISTS ONLY OF BEDROOMS AND THE WHOLE PART OF THE HALL AND SALON ON THE THIRD THERE ARE ONLY ATTICS AND THE TOP OF THE HALL.

GROUND FLOOR PLAN

PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5 EAST HARDING STREET, FETTER LANE E.C.





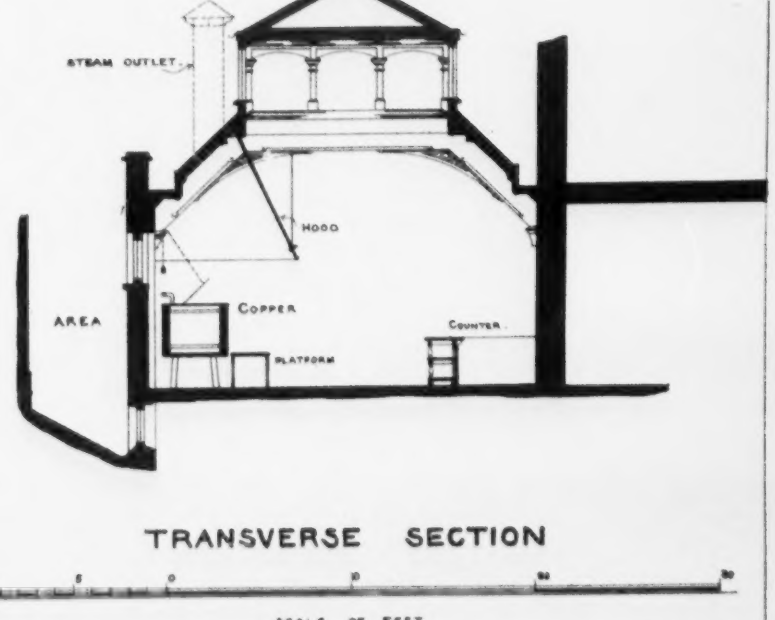


PHOTO LITHO. SPRAGUE & Co. LTD. 4 & 5 EAST HARDING STREET FETTER LANE E.C.

SOUP KITCHEN FOR THE JEWISH POOR, BUTLER STREET, E.—Mr. Lewis Solomon, F.R.I.B.A., Architect.

example of the restrained and dignified style of mansion architecture characteristic of its period. The plan shows the rather favourite arrangement at the time of placing the servants' quarters and offices in subsidiary wings connected to the main block by quadrant colonnades. In modern life this separation of the servants so far from the main residence would be considered inconvenient; but its architectural effect is so admirable that it is perhaps worth consideration whether it has not, even in a practical sense, some compensating advantages.

ADDITION TO "HOPEDENE," SURREY.

THIS represents an addition made to a house in Surrey, where the limitations of site for the new wing necessitated the formation of a drive through to the stables. The connecting up to the old house at this point involved the removal of the old sanitary arrangements, all which had to be replaced.

The chief endeavour of the architect, Mr. Percy N. Ginham, was to carry out the work in the spirit of the old building, but at the same time to keep the wing "quiet," so as not to obtrude itself on the main building.

The new work was built with local bricks and tiles, by the local builders, Messrs. W. & G. King.

SOUP KITCHEN FOR THE JEWISH POOR.

IN this week's number we illustrate the soup kitchen for the Jewish poor recently opened by the Lord Mayor and sheriffs. As this is a building with special requirements, which is said to answer its purpose exceedingly well, its plan and arrangement may be of practical interest.

The building occupies a site having a frontage to Butler-street, Spitalfields, of about 68 ft., and a depth of about 54 ft. After the site had been bought the committee instructed their architect, Mr. Lewis Solomon, to prepare plans, keeping the whole of the ground floor for the purpose of the soup kitchen, and making use of the basement and upper floors for the purpose of bringing in income, as the land was already theirs and there would only be the extra cost of the builders' work to pay.

The soup kitchen itself occupies the back or north portion of the whole of the ground floor, and in it are a 12 h.-p. vertical boiler supplying steam for cooking and nine coppers, each capable of cooking about sixty gallons of soup. In the kitchen, also, is a bread rack to take a ton and a half of bread—the consumption for one night—and bins to hold a large quantity of peas and other cereals. The applicants for soup enter at the east end of the building through the waiting-room, which contains a maze or barrier capable of enclosing about a hundred people, so as to obviate any struggle for priority of admission. They pass in front of a counter behind which the lady visitors serve out bread and the cooks serve out soup, and they go out at the west end through a corridor leading into the street. The walls of the kitchen, waiting-room, and corridors are covered with opalite glazed tiles, so that the premises are always clean and can easily be brushed down and washed. At the west end of the kitchen is a meat-chopping room with sinks and marble table-top for the cook's use, also more vegetable bins, and below there are store and coke cellars. Every applicant before receiving any bread and soup must produce a voucher which can be obtained only after inquiry, and the inquiry is made by the committee in the committee-room, where each applicant enters by the north-east door through the centre lobby and leaves by the north-west door through the exit lobby; this system of entrance and exit by separate passage being adopted to save ugly rushes.

A separate entrance in the street, further west than the poor people's exit, is the entrance to the upper portion of the building, now used as a girls' club by Jewish working girls, who have a large dancing or recreation room 44 ft. by 26 ft. wide, also cookery classroom, other classrooms, and reading-room. The basement forms a large store, having an area of about 2,250 ft., which can be used as storage or workshop, as there is a fireproof ceiling over and a separate lift entrance from the street. To the extreme west of the building a small house has been built, as the area of ground bought was rather larger than was required for the soup kitchen purpose.

The work has been carried out by Mr. Roberts, of Canonbury, who has also laid on all over the building electric wiring for the light, which is supplied by the Borough of Stepney. Gas-brackets are fixed at all crucial places to prevent a panic should electricity fail at any time. The boilers and coppers have been supplied by Messrs. Benham, of Wigmore-street. The front elevation is of red Ibstock brick, with Edwards' Ruabon terra-cotta dressings. The interior of the premises is of a very simple character, so as to save expenditure as far as possible.

The total cost of land and buildings works out at about 10,000*l*.

DRAWINGS SENT WITHOUT NAMES.

WE must make again a strong protest against the careless and unbusinesslike practice of many architects in sending us drawings for acceptance without the author's name attached to them, and sometimes without even a title to identify them.

Some architects seem to think that the fact that they have written to the editor proposing to send certain drawings, is sufficient to enable him to identify those drawings if they are sent weeks or months after, without a letter and without a name or address on them. This carelessness not only causes us a great deal of unnecessary trouble, but in one or two cases has nearly led to serious mistakes. Every drawing sent to us should have the architect's name and address on the back or margin.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—A meeting of this Association was held on the 14th inst., Mr. S. W. Kershaw in the chair. The Rev. H. J. Dukinfield Astley read an exceedingly interesting paper upon "A Group of Norman Fonts in North West Norfolk," which was capitally illustrated by nearly 100 lantern slides from photographs taken by Mr. E. M. Beloe, of King's Lynn, and lent by him. The north-west corner of Norfolk is remarkably rich in Norman fonts and, with one exception, they are all to be found in a very restricted area, viz., that portion of the county which lies between the Wash on the west and a line drawn from Lynn to Wells on the east, and are to be seen in the following churches, viz., St. Mary, Hunstanton; St. Michael, Ingoldisthorpe; St. Lawrence, Castle Rising; St. Mary, South Wootten; S.S. Peter and Paul, Shernborne; St. Mary, Boythorpe; St. Mary, Great Snoring; All Saints, Toftrees; All Saints, Sculthorpe; St. Martin, Fincham; and St. Mary, Burnham Deepdale. Fincham is the only one outside the area named, and is considerably to the south of Lynn between Downham and Swaffham, but is still within North West Norfolk. Fortunately these fonts are in good condition, the only one that has been mutilated being that at Ingoldisthorpe, which has had the corners hacked off in order to make it octagonal. This was probably done in the fourteenth century, when the rage for octagonal fonts was at its height, and the people, wishing to be in the fashion, were too poor to have a "modern" font made. The remains of the original Norman carving may be seen on each alternate face. These fonts vary considerably in size, height, depth of bowl, and other particulars. They fall naturally into two sub-groups:—(1) those ornamented with patterns of various kinds, all having a strong family likeness, such as the cable pattern, bead and scroll work, lozenges, circles or squares with interlacing lines, &c.; and (2) those bearing figure sculpture, of animals or of men, or of both in combination. The font at Burnham Deepdale is remarkable from its carved illustrations, in which it would appear to be unique, inasmuch as they are not representative of scriptural subjects, but are taken from the agricultural and domestic life of our Saxon forefathers. They bear a strong resemblance to those which represent the months of the year in the Anglo-Saxon calendar contained in the Cotton M.S. (Julius A. 6.) and others, but, at the same time, there are marked differences. Some of these fonts have been described as purely Saxon, but though some may have been wrought by Saxon artificers—and the rudeness of the figures on the Fincham and Burnham Deepdale fonts would point to this being so in their case—yet, as regards the period of their execution, they must be considered to be post-Norman. For many years after the Conquest work of this kind must, doubtless, have been performed by Saxon masons and carvers, but a careful comparison of the ornamentation of these two fonts with that of others known to be of Norman date shows the influence of Byzantine art upon them, and they may be properly classified under the designation Norman and not Transitional. In the discussion which followed, the Chairman, Mr. Goddard, Mr. Gould, Mr. Atkinson, the President of the Viking Club, Mr. Johnson of the Viking Club, and Mr. C. J. Williams took part.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The bi-weekly meeting of this Society was held on Thursday, the 15th inst., the President, Mr. Butler Wilson, in the chair. At the conclusion of the usual business, a paper entitled "Rome—Ancient and Modern," was read by Mr. Arthur Marshall, President of the Nottingham Society. The lecturer remarked that although there was ample evidence of regal Rome possessing structures of some magnificence, it was left to Imperial Rome to furnish the city with its most striking monuments. The best preserved of these was undoubtedly the Arch of Constantine, the sculptures of which had previously adorned other edifices. The Pantheon, the Catacombs, the Colosseum, amongst others, were also fully described with the assistance of lantern slides, most of them excellently coloured by Mr. Marshall's own hand. A vote of thanks to the lecturer was moved by Mr. H. S. Chorley, Hon. Secretary, who dwelt upon the fact that a great portion of Rome, as we see it to-day, was built from the materials of other and more ancient structures, which had long since disappeared. Mr. Robert P. Oglesby, in seconding the vote, referred to the welcome decision of the Italian Minister of Instruction to place marble records upon the site of vanished structures, thus enabling all to see the positions once occupied by Rome's quondam monuments. In conveying the Society's thanks to the lecturer, Mr. Butler Wilson remarked that the oftener one visited Rome, the deeper was the impression left. It was quite possible to leave Rome, after first acquaintance, depressed and overwhelmed by the magnitude of its architectural wealth. Only by repeated visits could Rome be satisfactorily grasped and realised

EDINBURGH ARCHITECTURAL ASSOCIATION.—The Associate Section of this Association held their third ordinary meeting of the session on Wednesday, 14th inst., at 117, George-street, Mr. J. Douglas Trail in the chair. Mr. Ramsay Traquais read a paper on "Scottish Domestic Detail." In the course of this paper Mr. Traquais dwelt upon the importance of detail to domestic work, and pointed out the necessity for simplicity. He also touched upon the method of study for old work, and the application of such study in our design. The paper was illustrated by an excellent series of photographs specially taken for this lecture, and in showing these the lecturer pointed out the entire absence of any fuss or unnecessary detail, and showed that there was no striving after "effect." Attention was drawn to the manner in which accidental features were taking advantage of in the old work.

THE ARCHITECTURAL ASSOCIATION OF IRELAND.—This society is holding a series of demonstrations during the current session. It is intended that members shall meet at the premises of some of the leading Dublin firms connected with the building trades, where opportunities will be afforded them of seeing work in operation and of learning to discriminate between good and bad materials and workmanship. Special attention is to be devoted to the utility of Irish materials. As an incentive to earnest work, prizes have been offered to the members. Amongst the firms co-operating are Messrs. Campbell & Co., T. & C. Martin, Edmund Sharp, J. & C. M'Gloughlin, Tonge & Taggart, Rome & Co., William Baird, Egan & Tatlow, and Keatinge & Sons. The first of the series of demonstrations was held at the premises of Messrs. John M'Ferran & Co., Beresford-place. Mr. R. M'Ferran having explained the various qualities of drain pipes, showed a double-socketed pipe, which has the advantages of rapidity in laying, true alignment, and resistance to subsequent depression. Various

samples of English, Irish, and Scotch bricks were brought to the notice of the members, the durability, quality, and facilities of manufacture of each being commented upon. The weather-resisting qualities of Irish, Welsh, American, and French slates were compared, some excellent examples of the Killaloe slate being especially noticeable. The demonstration concluded with a series of tests on Irish Portland cement by a representative of the firm. Many methods of distinguishing good from bad materials were explained. Mr. M'Ferran was assisted by a representative of the Bourtreehill Coal Co.—The eighth general meeting of the session was held in the Grosvenor Hotel, Dublin, Mr. C. J. McCarthy (City Architect) presided. A lecture was delivered by Mr. A. E. Child—who has recently been appointed teacher in the School of Art, Kildare-street—on "Stained Glass Work." The lecturer dealt with his subject from the point of view of a craftsman thoroughly imbued with that school of thought which, avoiding mere copyism of past accomplishments in art, seeks inspiration from the best elements of such, and goes to nature's boundless garden for the rest. The pictures thrown on the screen included a number of windows recently put up in Gloucester Cathedral, illustrating the best principles which should influence stained glass work. The lecturer explained in detail the method of painting glass, and advocated the doing of the whole window together, rather than in separate bits—as often in commercial work. He showed that the use of enamel as a colouring medium was bad because of the difference between contraction and expansion between the glass base and the superimposed enamel. The pigment should fuse at a slightly lower temperature than the glass, so as to become part of it during the burning. It is often necessary to subject the glass to two or three burnings before the right effect is gained. The usual course is to use tinted or white glasses, and by shading them with a preparation of oxide of iron and manganese to obtain the required effects and outlines. The lecturer indicated, on one picture, a form of Celtic decoration which is at present being taught to the students in the School of Art. He spoke very strongly against the popular way of cutting down the price allowed for stained glass below that at which it was possible to get good work, and advocated the concentrating the effort and expense on one part of the work (in preference to carrying out a large quantity of mediocre design and workmanship) and to leave everything else quite plain until it is possible to complete all in harmony with the first.

COMPETITIONS.

CARNEGIE FREE LIBRARY, LOWESTOFT.—The plans sent in for the erection of the Free Library have been considered by the Town Council. Mr. J. T. Bottle, architect, of Yarmouth, was appointed assessor to advise the Building Committee. The assessor's report on the plans sent in by the various competitors was read and considered. The Committee recommended that, as advised by the assessor, the design "Harmony" be adopted, subject to the same being approved by Mr. Carnegie, and to a satisfactory tender being received for the erection of the buildings for a sum not exceeding 6,000*l.* The architect of the design "Harmony" was found to be Mr. George William Leighton, of Ipswich. Eight other sets of drawings were submitted, by the following architects:—Messrs. R. S. Cockrill, Lowestoft; J. W. Roberts, Lowestoft; F. W. Richards, Lowestoft; H. J. Green, Norwich (three sets); Geo. Barnes & Son, London and Lowestoft (placed second); and Herbert Bignold.

THE BUILDER'S FOREMEN'S ASSOCIATION.

THE ninth annual dinner of the Builder's Foremen's Association was held on Saturday last at the Holborn Restaurant. Mr. J. C. Hill, Chairman of the Fletton Brick Company, presided over a large gathering numbering close upon 200, which included Messrs. T. E. Clark (Mr. Carmichael), H. T. Ashby (Ashby Bros.), R. Gardiner (Hicks, Gardiner & Co.), Sheffield (Sheffield Bros.), B. G. Thompson (Trollope & Son), H. Hibberd (Hibberd Bros.), J. Campbell Cree; B. Carter (Stephens & Carter), W. Salter (Salter & Co.), Sydney Butler, R. W. Stevenson (London Brick Company), Gathercole (Gathercole Bros.), Spencer Green (past President of the Clerk of Works Association), and Mr. W. Cook, Secretary.

Following the usual loyal toasts, the Chairman gave "Success to the Builder's Foremen's Association." He said that in looking at the objects of the Association, he saw it was formed to promote the welfare of those having the control of the erection of buildings. He ventured to think that was a very good object. It depended very largely upon the foreman whether a building was stable or whether it was not. They knew that the architect also provided a very useful individual, the clerk of works, who was sometimes more ornamental than useful. The objects of the Association were threefold. The monthly meetings were of an educational and social nature, and there was no doubt that such meetings were very helpful, more especially to the junior members of the profession. It must be a very great benefit to such men to meet and chat with those of greater experience in the same walk of life as themselves. A builder's foreman had never done educating himself. New designs in architecture came out, new methods of construction in buildings were constantly being evolved, and new building materials were always being placed on the market, and if the builder's foreman was to be at the top of the ladder he had constantly to be educating himself up to take advantage of all those things. But having obtained the necessary knowledge to become a builder's foreman his troubles by no means ceased. He had to please the architect and the clerk of works; he had all the difficulties of the labour market to contend with, and, therefore, he had to be a man of great judgment and tact. Last, but not least, he had to please his employer and make his job pay. Turning to larger questions, he would like to refer for a moment to the question of education. The Government, in his opinion, had only given them an instalment of the reforms that were required. He would like to see education made an Imperial tax, and provision made for every young man getting a thorough technical training. We were now fighting for the markets of the world. For centuries we had had those markets in our hands, but we should have to fight for them in the future, and while the Government were providing higher education for the children, he would like to see in every town and village in the country a first-class Government school with a large technical institute attached to it. He would even go further, and desire to see practical workshops in connexion with the schools where boys might learn the practical rudiments of the trade they were going to get their living by. Reverting back to the Association, he said that the third object which struck him as being a most useful one was the self help and self protection which it afforded its members. In conclusion, the Chairman said he would like to see the Association better supported by the builders and contractors of the metropolis, and he would have pleasure in becoming an honorary life member with a donation of ten guineas.

Mr. Geo. Thomson (President of the Association), in responding to the toast, said it was extremely gratifying to him to see such a large gathering present to help and encourage those who had the welfare of the Association at heart. They had no hesitation in asking the builders to help them, for the Association placed no restriction upon its members in the fulfilment of their duties; if anything, it was rather a help to employers. They would not be satisfied until they could raise a fund for the benefit of aged builder's foremen and for those they left behind them unprovided for.

Mr. Sydney Butler, in giving the toast, "The Building Trades," remarked that if the building trade was good so was the rest of trade, and if it was bad it was sure proof that the country was suffering from depression. There was no trade that was so absolutely essential to the well-being of the inhabitants, for it was of the greatest importance that the houses in which the people lived should be well and properly built.

Mr. H. T. Ashby, in responding, said that as representing one of the employers of the building trade of London he considered that the welfare, the good name, and the profit-earning capacity of the building trade rested more with the foreman, than with those who were supposed to direct it. Personally he believed in combination for both masters and men, and when he was President of the Institute of Builders he was always glad to meet the representatives of those who carried out the great building works of London. He did not believe in employing rough methods, or in bullying men, and more than once when he had found a foreman using coarse language to the men under him, he had got rid of him. The most successful foremen were those who set out to enlist the sympathies and regard of those over whom they ruled. Referring to the educational work of the Association he said he trusted it would continue to develop, and as time went on he hoped the council would be able to institute examinations of a practical character, which would go far to enhance the reputation of the Association. He agreed with the suggestion of the President that it would be a good thing to establish a fund for the relief of decayed members, and if such a fund were started he would be only too pleased to give it assistance.

Mr. B. T. Price proposed the toast of the Visitors, which was suitably acknowledged by Mr. S. White, and the health of the Chairman was afterwards drunk on the invitation of Mr. B. Carter.

THE LONDON COUNTY COUNCIL.

THE first meeting of the London County Council after the Christmas recess was held on Tuesday afternoon in the County Hall, Spring Gardens. Sir J. McDougall, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Camberwell Borough Council 4,750*l.* for land and depots in Grove-vale, Bonar-road, Peckham-park-road, and Glengall-road; and 23,000*l.* for erection of baths and washhouses; Southwark Borough Council 14,250*l.* for extension of Town Hall; St. Pancras Borough Council 20,000*l.* for electric lighting purposes; Islington Guardians 4,000*l.* for alterations, &c., to workhouses; Stepney Borough Council 10,000*l.* for street lighting and 3,545 for conveniences; and sanction to loans, to Westminster City Council 1,689*l.* for depot buildings; Islington Borough Council 4,128*l.* for purchase of land for depot; Westminster City Council 5,473*l.* for street improvement; Hampstead Borough Council 3,644*l.* for street lighting; Lambeth Borough Council 906*l.* for paving works.

Hainault Forest.—The Parks and Open Spaces Committee brought up the following report:—

"We have received and carefully considered a memorial from the Commons and Footpaths Preservation Society, the Kyrle Society, the Metropolitan Public Gardens Association, and the National Trust for Places of Historic Interest or Natural Beauty, asking the aid of the Council in securing 803 acres of land at Chigwell-row for the purpose of a public open space. The land is without the county of London, and is on the highest part of the ridge which separates the valley of the river Roding from the valley of the Thames. It is, in its highest parts, 300 ft.] above the Thames, and occupies a position commanding magnificent views of the surrounding country. The greater part of it is within a twelve-mile radius from the Bank of England, and is consequently within an easy distance of the east-end suburbs of London. It comprises the last remaining unenclosed portion of the historic Forest of Hainault, formerly part of the ancient Royal Forest of Waltham or Essex, the other part of which is now known as Epping Forest. The property is in four ownerships, and the memorialists inform us that negotiations with all of them are in an advanced stage. . . . It is proposed to acquire 803 acres of land, about a mile from Grange Hill station on the new branch of the Great Eastern Railway, for a sum of 21,830*l.*, or as stated in the memorial 22,000*l.* in round figures, and towards this the Council is asked to subscribe 10,000*l.*, that being the amount necessary to complete the purchase-money, it being understood that when acquired the land shall be vested in the Council to be maintained by it in perpetuity as a public open space. . . . To enable local authorities to contribute, Parliamentary authority will be required, and in order that such authority should be obtained at the earliest moment, Mr. E. North Buxton, who has been conducting the negotiations so far, has given notice of the necessary Bill, and the Council is asked to take charge of the Bill. We recommend that the estimate of 10,000*l.* submitted by the Finance Committee be approved, and that the Council do agree to contribute that sum towards the purchase of about 803 acres of land at Chigwell-row, shown on the plan submitted with this report, conditionally upon the remainder of the purchase money being provided by county and other authorities and by private subscriptions, and upon the land being vested in the Council to be maintained by it as a public open space."

A petition was presented from ratepayers of

Ilford, expressing the hope that the Council would not purchase Hainault Forest, as Ilford would have to pay 4,000*l.* towards such purchase. The petition was referred to the Parks Committee.

Mr. Sankey moved as an amendment that recommendation "a" be referred back. It was not a matter of providing open spaces for the County of London, but it was taking away a very large tract of potential building land outside London altogether, being 13½ miles distant from the County Hall. The City Corporation had not seen their way to buy the land. He did not wish to negative the proposal altogether, but to refer the question back, to see whether it was not possible to buy one strip of land only, which was more or less in its natural state, as the greater part of the land was destitute of any beauty whatever, being simply agricultural land. He was afraid that if the Council showed itself too willing to purchase these open spaces it would curb the liberality of private persons in that direction.

Mr. Cousins, in seconding the amendment, said the recommendation raised a question of principle, viz., whether they should spend the money of Londoners for open spaces outside the county. The question was one entirely for the ratepayers of Essex.

After discussion there voted for the amendment 17; against 87. The Committee's recommendation was then agreed to.

Greenwich Tunnel: Proposed Subway.—It was agreed that a contribution of one-third of the net cost of the construction of a subway proposed to be undertaken by the Great Eastern Railway Company between their North Greenwich station and the Poplar entrance to Greenwich tunnel, be made by the Council, such contribution not to exceed the sum of 350*l.*

Tramways.—The Highways Committee recommended, and it was agreed:—

"(*a*) That the estimate of 25,000*l.*, submitted by the Finance Committee, be approved; and that the expenditure on capital account of that sum be authorised for the purchase of the horses, rolling stock, &c., of the South London Tramways Co. in pursuance of the agreement for the purchase of the company's undertaking entered into under the resolution of the Council of July 15, 1902.

(*b*) That the estimate of 5,000*l.*, submitted by the Finance Committee, be approved; and that the expenditure on maintenance account of that sum be authorised for the purchase of the consumable stores, &c., of the South London Tramways Co., in pursuance of the agreement for the purchase of the company's undertaking entered into under the resolution of the Council of July 15, 1902."

Foreign Rails.—The same Committee stated that the tender of Messrs. P. & W. Maclellan, Ltd., Glasgow, had been accepted at 33,876*l.* 19s. 8d. for the supply of rails, &c., for the reconstruction, for electrical traction, of the New Cross and Greenwich, &c., section and small sections in the Borough.* Messrs. Maclellan propose to obtain the bolts and nuts from Messrs. Ibbotson & Bros., of Sheffield, while the rails, &c., will be obtained from the Société Anonyme des Acieries d'Angleur, Belgium, who are the sub-contractors under the present contract.

Mr. Steadman moved that the paragraph be not received, and said he would continue to protest against the contracts being executed abroad. Why should the working man in this country be penalised because of the royalty system in another country? It was a disgrace to a civilised country to see the unemployed working classes pouring in their thousands from East London, and marching through the streets, and yet this great Municipality, which boasted of its Labour policy, was prepared to send its orders to Belgium, and thereby intensify the distress already existing in this country. Between one thing and another it seemed to him that the British workman would soon have no employment at all in England.

Mr. Cousins seconded the amendment. He pointed out that the Council was very strict in its conditions with regard to an English manufacturer, and this must affect the price of the manufactured article.

Mr. Benn (Chairman of the Committee) said he was sorry to say that, with regard to quality and regularity, they had not had satisfaction from English manufacturers, while they had had satisfaction from Belgium. As a matter of fact, 85 per cent. of the materials required for the tramways were made at home, but, for the sake of the commercial success of the tramway undertaking, the Committee would not be diverted from the policy they had carried out unless they got fresh instructions from the Council.

After further discussion the amendment was rejected.

The Council adjourned soon after 7 o'clock.

* See our "Tender" columns for list of tenders.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Fulham.†—A mission hall, on the western side of Wandsworth Bridge-road, at the corner of Hugon-road, Fulham (Messrs. Z. King & Son for Messrs. S. & R. W. Black).—Consent.

Poplar.—Retention of a projecting booby-hutch, on the fourth floor level, at Concordia Wharf, Cold Harbour, Blackwall (Mr. J. M. Knight for the Australian Meat Co.).—Consent.

Fulham.—Retention of a one-story shop adjoining, to the eastward, the Cannon Brewery, Lillie-road, Fulham (Mr. A. Roberts for Messrs. J. Lovibond & Sons, Ltd.).—Consent.

Islington, South.—A one-story shop upon the forecourt of No. 170, Barnsbury-road, Islington (Mr. R Pointer for Mr. H. Ward).—Consent.

City.—That the application of Mr. A. E. Pridmore for an extension of the period within which the erection of an iron and concrete gangway across Falcon-avenue, to connect, at the first floor level, a block of warehouses known as Nos. 9, 10, and 11, Falcon-street, with No. 6, Falcon-avenue, City, was required to be completed, be granted.—Consent.

Clapham.—Stone and iron balconies in front of three houses on the north side of Thurleigh-road, Clapham, eastward of Gayville-road (Mr. H. Branch for Messrs. J. Nicks & Co.).—Consent.

Hackney, North.—That the application of Messrs. Gordon & Gunton for Mr. J. W. Gandar-Dower, for an extension of the periods within which the erection of warehouse buildings on the site of Nos. 36, 38, and 39, Boleyn-road, Kingsland, was required to be commenced and completed, be granted.—Consent.

Hampstead.—Wood and glass enclosures to a projecting stone portico at the entrance to No. 11, Langland-gardens, Hampstead (Mr. W. Willett for Mr. F. M. Woollan).—Consent.

Lewisham.—Wood and slate pents over the entrances to six houses on the north side of Codrington Hill, Lewisham (Mr. E. Taylor).—Consent.

Marylebone, West.—Retention of a lantern light erected on the roof of the scullery in the area on the north side of No. 12, Montagu-street, St. Marylebone, abutting upon Upper George-street (Messrs. Hudson & Hunt for Messrs. W. Phillips & Son).—Consent.

Marylebone, East.—A projecting iron sign in front of Nos. 192 and 194, Oxford-street, St. Marylebone (Mr. W. Graves for Messrs. Slaters, Ltd.).—Consent.

St. Pancras, North.—The retention of two sheds and a stack of scaffold poles on a site on the west side of Highgate-road, St. Pancras, in front of the Grove (Messrs. Boehmer & Gibbs for Mr. A. W. Armstrong).—Consent.

Chelsea.—An iron and glass shelter in front of the porch at No. 13, Fernshaw-road, Chelsea (Messrs. J. Weeks & Co., Ltd., for Colonel W. H. Roberts).—Consent.

Strand.†—Retention of an iron and glass shelter, erected in front of the Civil Service Co-operative Society, Ltd., 28, Haymarket, Westminster (Mr. A. G. Repton).—Refused.

Lewisham.—Two houses on the east side of Baring-road, Lee, southward of Heather-road (Mr. W. Barber for Mr. A. Durbin).—Refused.

Hampstead.—An iron and glass porch in front of No. 93, Canfield-gardens, Hampstead (Mr. J. D. Scott for Mr. A. J. Benjamin).—Refused.

Islington, East.—A one-story addition upon part of the forecourt of No. 112, Drayton Park, Islington (Messrs. Young & Hall for the Express Dairy Co., Ltd.).—Refused.

Kensington, South.—A motor-car stable and petrol store at 16, Addison-crescent, Kensington, to abut upon Addison-crescent and Holland-road (Messrs. Harrison & Son for Mr. H. Liddell).—Refused.

Lambeth, North.—The rebuilding of Nos. 7, 9, and 11, Lambeth-road, Lambeth, to abut upon China-walk (Mr. H. N. Smith for Mr. B. Blaiberg).—Refused.

Strand.—An iron and glass shelter at the entrance to the grill-room at the Grand Hotel, Charing Cross, to overhang the footway in the Strand (Mr. W. Woodward for the Gordon Hotels, Limited).—Refused.

Width of Way.

Southwark, West.—An addition to Messrs. Thorburn, Bain, & Co.'s premises on the east side of Broadwall, Southwark (Mr. E. R. Hewett for Messrs. Thorburn, Bain, & Co.).—Consent.

Hackney, North.—An increase in the height of the back addition at the rear of No. 101, High-street, Stoke Newington, abutting upon Mason's-court (Mr. T. Gregg for Messrs. Showler & Co.).—Consent.

Westminster.—Two two-story cottages on the north side of Dorset-street, Vauxhall Bridge-road, Westminster, to abut upon Dean's-place (Messrs. Cluttons for the Ecclesiastical Commissioners).—Consent.

Southwark, West.†—The covering of a yard at the rear of No. 30, St. George's-road, Southwark, at less than the prescribed distance from the respective centres of the roadways of Princess-place and Princess-mews (Mr. W. W. Bull for Mr. J. J. Smith).—Refused.

Lines of Frontage and Width of Way.

Holborn.—A block of buildings on the south-east side of Shaftesbury-avenue, to abut also upon the eastern side of Vine-street, with projecting oriel windows, and a portion of the buildings at less than the prescribed distance from the centre of the roadway (Mr. R. J. Worley for the Shaftesbury-avenue Freehold Land Syndicate).—Consent.

Bermondsey.—The erection on the site of Nos. 306 and 308, Old Kent-road, and Nos. 2, 4, and 6, St. Thomas-road, Bermondsey, of a new Fire Brigade station with external walls at less than the prescribed distance from the centre of the roadway of St. Thomas-road (Mr. O. Fleming for the Fire Brigade Committee of the Council).—Consent.

Hackney, South.†—A building upon the site of No. 155, Mare-street, Hackney, with the external walls of such building at less than the prescribed distance from the centre of the roadway of Helmsley-street (Mr. J. Hamilton for the directors of the National Provincial Bank of England).—Consent.

St. Pancras, West.—A porch on the east side of St. Mary Magdalene's Church, Munster-square, St. Pancras, at less than the prescribed distance from the centre of the roadway of Laxton-place (Mr. J. T. Micklethwaite for the vicar and churchwardens of the church).—Consent.

Chelsea.—A one-story building upon a site adjoining No. 11, Bury-street (Messrs. Pooley & Follett for the Metropolitan Horse Shoeing Company, Limited).—Refused.

Hampstead.—Residential flats on a site on the south side of West End-lane, and east side of Mill-lane, Hampstead (Mr. C. H. B. Quennell for Mr. A. Bretzfelder).—Refused.

Islington, North.—Three houses, with shops, on the north-west side of Tollington Park, and four dwelling-houses on the south-west side of Pine-grove, Islington (Mr. H. Branch).—Refused.

Rotherhithe.—A porch in front of No. 39, New Church-street, Bermondsey (Mr. E. Crosse for the Rev. E. N. Coulthard).—Refused.

St. Pancras, East.—Retention of a greenhouse on a site on the eastern side of Camden-road, St. Pancras, at the corner of King's-road (Messrs. W. F. Meakin & Son for Messrs. Bourne & Underwood).—Refused.

Strand.—A timber-framed oriel window on the ground floor, a brick oriel window on the first and second floors, and a verandah on the third floor in front of No. 11, St. James's-place, St. James, Westminster (Mr. J. W. Stonhold for Mr. H. M. Matheson).—Refused.

Woolwich.—The re-erection of No. 81, Wellington-street, Woolwich, abutting upon Upper Market-street (Mr. H. P. Monckton for Lieutenant R. L. A. Ogilby).—Refused.

Space at Rear.

Dulwich.—Deviations from plans sanctioned by the Council for the erection of five houses (partly on the site of Grove-cottages), in a way leading out of Camberwell-grove, Camberwell, so far as relates to an alteration in the space to be provided at the rear of three of the houses (Mr. E. W. Mitchell).—Consent.

Kensington, South.—A modification of the provisions of Section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a block of residential flats on a site on the southern side of Brompton-road and eastern side of New-street, Kensington, with an irregular open space at the rear (Mr. C. W. Stephens for Messrs. Stuttaford & Co., Ltd.).—Consent.

Width of Way and Space at Rear.

Wandsworth.†—Stables, with a forage loft and habitable rooms over, at Gothic Wharf, Brewhouse-lane, Putney (Mr. A. E. Chasemore for Mr. T. S. Jay).—Content.

Formation of Streets.

Lewisham.—That an order be issued to the Kinnaird Park Estate Co., Ltd., sanctioning the formation or laying out of a new street for carriage traffic, out of the north-east side of Bromley-road, Lewisham.—Agreed.

Lewisham.†—That an order be issued to Mr. R. Stewart, refusing to sanction the formation or laying out of a new street for carriage traffic to lead out of the west side of Torridon-road, Lewisham (Mr. A. Cameron Corbett, M.P.).—Agreed.

Hackney, South.—That an order be issued to Mr. H. Brodey, refusing to sanction the formation or laying out of new streets for carriage traffic out of the south side of Ashenden-road, Hackney (for Messrs. A. & A. Simpson).—Agreed.

Means of Escape from the Top of High Buildings.

Holborn.—Means of escape in case of fire, proposed to be provided on the sixth story of a building to be erected upon the site of Nos. 83, 85, and 87, Southampton-row, Holborn (the upper surface of the floor of which story will be above 60 ft. from the street level), for the persons dwelling or employed therein (Mr. C. F. Doll for Mr. H. Walduck).—Consent.

Kensington, South.—Means of escape in case of fire, proposed to be provided on the sixth story of Durward House, at the junction of Kensington-court and Thackeray-street, Kensington, for the persons dwelling or employed therein (Mr. D Brown).—Consent.

Deviation from Certified Plans.

City.—Certain deviations from the plan certified by the District Surveyor, so far as relates to the proposed re-erection of No. 37, Hutton-street, City (Mr. H. A. Satchell for Messrs. Edward Lloyd, Ltd.).—Consent.

Working-class Dwellings.

Hampstead.—A dwelling-house, not abutting upon a street, on a site at the rear of Nos. 23-24, High-street, Hampstead, next Gayton-road (Mr. B. E. Atkinson, jun., for Mr. J. W. Fenn).—Consent.

Hackney, South.—That the Council do make no order upon the application of Mr. W. M. Dabbs for sanction to the erection of dwellings on land at the rear of houses on the south-west side of Windsor-road, Hackney-wick, Hackney.—Agreed.

*** *The recommendations marked † are contrary to the views of the Local Authorities.*

TRADE CATALOGUES.

WE have received from Messrs. Green, Ltd., of 155, High-street, Lewisham, S.E., their catalogue of bakers' ovens. On the title-page they describe themselves as "architects, builders, and bakery engineers." They might also have added "surveyors," as on page 11 we find a list of their charges for measuring works and preparing quantities. The catalogue, as a whole, suffers from *tête montée*. An illustration of an ancient Pompeian bakery is followed by the statement—"The only really satisfactory bakers' ovens invented since the period of those in our illustration (which was about the date of the coming of our Saviour), that to our knowledge have been sold in any such large quantity as to justify their general use by the baking trade, are Green's Self-acting Hygienic Smokeless and Continuous Hot-air Ovens." The catalogue, which cannot fail to be of service to bakers in search of an oven, contains many reproductions from photographs of ovens which have been built by the firm, and also plans and sections and five typical plans of bakeries. Complete prices are given, together with laudatory press-notices and testimonials from bakers.

Messrs. Fredk. Jones & Co., of Perrin-street, Kentish Town, N.W., send us a little pamphlet entitled, "Notes on Non-conductors of Heat." It contains a description of silicate cotton, or slag-wool, and tables of experiments showing the comparative values of this and other materials used for covering boilers, steam-pipes, and heating-pipes, and for the insulation of refrigerating chambers. Particulars are also given of the particular forms in which silicate cotton is supplied—loose, or sandwiched between wire netting, or sewn on strips of canvas, or fixed to sheets of galvanised iron, &c. The catalogue is illustrated with reproductions from photographs, and contains a concise price-list.

Messrs. Thomas Cropper & Co., of Chelsea, have sent us a copy of their catalogue of sanitary fittings. It is a large book of 200 pages, well printed and fully illustrated. Among the contents are drain-traps and gullies, manhole channels, steps, and covers, automatic flushing tanks, drain-testing and clearing apparatus, sinks, water-closets, urinals, lavatories, baths, traps, and other fittings, lead and iron soil-pipes, hot-water tanks and cylinders, kitchen-range boilers, heating-apparatus boilers and radiators, inlet and outlet ventilators, pumps, and fittings for speaking-tubes, electric bells, and gas. The catalogue is not lacking in variety, but some of the subjects we have mentioned are dismissed in few pages; by far the greater part of the book is devoted to sanitary work. We do not notice any important novelty, but many of the fittings are designed on correct lines, and the catalogue as a whole will prove useful to architects and builders. We need scarcely say that many of the "ornamental" fittings — particularly the lavatories—are, in this catalogue as in so many others, far from artistic; surely it would pay to spend a little money on new and less ornate designs for cast-iron standards and friezes.

Correspondence.

NATURAL AND ARTIFICIAL SEWAGE PURIFICATION.

SIR,—I have read with considerable interest the review in your paper on the book "Natural and Artificial Sewage Treatment," lately published and jointly written by Colonel Jones and myself.

You observe that I seem to have a strong bias in favour of land treatment, and to have allowed this bias to influence my work in a manner which robs it of a good deal of its value. As I was not aware of this so-called bias—having only quite recently recommended in one case the employment of contact beds followed by land treatment, so as to lighten the labour of the land, which was not available in sufficient quantity—I should feel much obliged if you would kindly undertake to support your statements by testimony from anything I have stated in the sixty-nine pages of my part of the book referred to.

In the meantime, allow me to assure you and your readers that my intention in writing the book was to place material before them which would enable them to form their own conclusions, and surely you will not blame them if they—like myself, from an impartial survey of all the facts of the case, are driven to the conclusion that the land treatment of sewage possesses greater merits than any of the artificial or so-called bacterial or biological methods, and that the methods possessing lesser merits cannot be considered of equal value to the method possessing greater merits.

You also find fault with me for not having mentioned the cases of "rank failures" of sewage farms. But it ought to have been evident that my aim was to elucidate fundamental principles and not to deal to any extent with the way these principles ought to be applied in every-day life, as this is a very large subject for itself. But granted that such failures have taken place, what do they prove? Surely not that the principle itself is wrong, but only that the particular application thereof is at fault. And in connexion with this, allow me to point out that in the majority of failures it has not been the particular quality of the land that was at fault, but the absence of practically any intelligent management. The Royal Commission doubts "if any land is entirely useless" for sewage purification, and my experience leads me to think that even what may be termed inferior land will with careful management do a wonderful amount of good work.

In support of my contentions I would ask you kindly to print the following comparative statement, which is in part taken from page 96 of the book, and which, I think, speaks for itself.

Comparative Statement of the Merits of the Natural and Artificial Sewage Treatment.

Results to be obtained from :—

A.—Natural Treatment.	*B.—Artificial Treatment.*
1. Removal of suspended matters.	1. Removal of suspended matters.
2. Removal of from 75 to 95 per cent. of the dissolved organic matters.	2. Removal of from 50 to 75 per cent. of the dissolved organic matters.
3. Removal of pathogenic germs.	3. Nil. Effluent bacterially practically raw sewage.
4. Utilisation of large portion of manurial elements.	4. Nil. All manurial elements escape into the rivers.
5. Great reduction of quantity of liquid.	5. No appreciable reduction of quantity of liquid.
Total: Five beneficial results.	Total: Two beneficial results.

H. ALFRED ROECHLING.

*** Mr. Roechling's letter is interesting, and we regret that we have not space for a detailed reply or for the long quotations which he asks us to give in support of our view that he appears to be biassed in favour of land treatment. We are still of opinion that too much was made of the points in favour of this method and against bacterial treatment, and that too little was said about the advantages of the latter and the disadvantages of the former. One quotation from the Preface, which is signed by Mr. Roechling as well as by Lieut.-Colonel Jones, will perhaps suffice to show his attitude:—"If it can be proved to them that Nature is not sure and true enough in its methods, the authors are prepared to assist it with methods and means produced by the inventive brain of man; but if such proof is not forthcoming, they adhere—in preference to groping in the dark—to Nature's own methods, knowing from experience that, when allowed full scope and fair treatment, it is most sure in all its ways." If this means anything at all, it means that the proof required has not yet been given, and that Mr. Roechling considers the search for artificial methods of sewage purification to be, even now, mere "groping in the dark."

At Mr. Roechling's request we have printed his comparative statement of the merits of natural and artificial sewage treatment, and this, we may say, is one of the passages we had in mind in attributing bias to the author.

We cannot pause to discuss the percentages in paragraph 2, but will merely say that they do not, in our opinion, correctly represent the facts. The question of pathogenic germs is more important. The "man in the street," for whose benefit Mr. Roechling writes (p. 29), would certainly gather from paragraph 3 that land treatment destroys all pathogenic germs in sewage, and that they all survive artificial methods of purification. This is certainly not true. It is not proven that even good sewage-farms destroy all such germs, and many sewage-farms certainly do not; on the other hand, numerous tests have shown that biological methods of purification often reduce the numbers of these germs in a striking degree.

The second Report of the Royal Commission on Sewage Disposal was in Mr. Roechling's hands before the publication of his book—he refers to it in a footnote on p. 35—but we think that a re-perusal of pp. 26, 87, and 88 will lead him to agree with us that paragraph 3 is misleading. Paragraph 4 also affords room for discussion, but we have said enough to show that the comparative statement, which Mr. Roechling asked us to quote, betrays either bias or deficiency of information.—ED.

PROPOSED BRIDGE AT COWES.

SIR,—Noticing an advertisement in your journal asking for tenders for the above, I applied for the particulars, which I enclose. The proceeding is so extraordinary that I feel justified in protesting against it.

The Council have an "Engineer," and I wish to know why he does not himself design the bridge in the usual professional way, have quantities prepared, or prepare them himself, and then ask for tenders in the proper way. If he is not competent so to do, the Council should employ an engineer and pay him his Institute Commission, or advertise for competitive designs pure and simple, offering a premium. Instead of which this delightful Council expects a score of manufacturers to make designs, take out quantities, and prepare estimates, who then become competitively both engineers and contractors.

But, notwithstanding the dual position, the unfortunate winner of the job is afterwards to be under the heel of the Council's Engineer in every respect, and tied down in such a manner that he could compel the contractor to carry out the work practically as he (the Engineer) may choose to dictate.

So, you see, first of all the Council suck the brains of a dozen firms, get hold of their ideas and plans, which are handed over to their Engineer, who, in a manner, whips the accepted contractor with his own cords, he being no longer respectable enough to be considered as the engineer of his own design.

The information thus obtained from the whole of the designers will educate the Engineer to this job, and he will get a more or less useful portfolio of plans to help the Council over the next bridge job.

It is high time this sort of thing was put down; and I for one will have nothing to do with any work so offered.

If a Council or a private individual does not want to employ a professional man, let them put the job into the hands of one competent firm of constructional engineers to deal with entirely, and not turn any number of these firms into competition semi-professional men, under the disguise of contractors tendering for a job.

I sincerely hope the Cowes Urban District Council will not get a single offer.

CONSTRUCTIONAL ENGINEER.

*** The following are the first three clauses of the Conditions referred to by our correspondent :—

"1. The contract will comprise the construction and erection of a bridge over the railway in the position shown upon the accompanying plan. The bridge to be constructed of steel, iron, or other suitable material.

2. Persons tendering are to submit prices for (1) a bridge 24 ft. wide, suitable for vehicular traffic, and (2) a bridge 10 ft. in width only. They are likewise to submit with their tenders, plans, and designs, together with a specification, and in the event of a tender being accepted by the Council, the contractor will be required to supply the engineer with all necessary preliminary drawings, and that previous to the construction of the bridge, all working details of the same shall be submitted to and be approved of by the engineer to the Council. The contractor shall erect such bridge in accordance with the detailed plans, to the entire satisfaction of the Council and their engineer.

3. The bridge shall be manufactured throughout of the very best materials and workmanship and be open for inspection at any time during period of construction. For this purpose the engineer shall have free access to the contractor's workshops."

THE STUDENT'S COLUMN. — Our "Student's Column" article, "Builders' Tools and Their Uses," is unavoidably held over.

APPOINTMENT OF SANITARY INSPECTORS.—The Local Government Board has sanctioned the appointment of the following sanitary inspectors:—Mr. H. J. Gentry, Greenwich: Mr. T. W. Dee, Woolwich.

BOOKS RECEIVED.

THE VENTILATION, HEATING, AND MANAGEMENT OF CHURCHES AND PUBLIC BUILDINGS. By J. W. Thomas, F.I.C., F.C.S. (Longmans, Green, & Co.)

LOCKWOOD'S BUILDER'S AND CONTRACTOR'S PRICE BOOK; 1903. Edited by F. T. W. Miller, A.R.I.B.A. (Crosby Lockwood & Son. 4s.)

THE LAW RELATING TO GAS, WATER, AND ELECTRIC LIGHTING. By Lawrence Duckworth. Second edition. (Effingham Wilson. 1s. 6d.)

THE BUSINESS MAN'S COUNTY COURT GUIDE. By Charles Jones. Third and revised edition. (Effingham Wilson. 3s. 6d.)

OBSTRUCTION TO LIGHT. By H. Bridges Molesworth, M.Inst.C.E. (E. & F. N. Spon.)

SOME QUICK AND EASY METHODS OF CALCULATING; a Simple Explanation of the Theory and Use of the Slide Rule. By R. Gordon Blane, M.E. (E. & F. N. Spon.)

PROCEEDINGS OF THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS. Vol. XXVII. Edited by Thomas Cole. (E. & F. N. Spon.)

GENERAL BUILDING NEWS.

RESTORATION OF INGLEBY-GREENHOW CHURCH, YORKSHIRE.—Ingleby-Greenhow Church is to be restored and re-seated. Plans and specifications have been prepared by Mr. Temple Moore, and the cost is estimated at about 700*l.*

SCHOOL BOARD, GATESHEAD.—The Gateshead School Board have now entered upon possession of their new schools in Kelvin Grove. The block is arranged to accommodate infant scholars on the ground floor and junior boys and girls on the first floor. This, the first of two blocks, is part of the full scheme providing accommodation for about 1,500 scholars, and is placed with the main elevation towards Kelvin Grove. The school is arranged on the Central Hall plan. The accommodation provided in this block is for 760 scholars, as follows:—Ground floor, 400 infants in seven classrooms, with places for sixty-six, fifty-six, and forty-five respectively. First floor, 360 junior boys and girls in seven classrooms with places for sixty, fifty, and forty respectively. A class of sixty could be placed in the junior central hall, making a total accommodation of 820 infant and junior scholars. The classrooms are compactly arranged around the central hall, where, by the use of glazed screens, the head teacher is enabled to have the full supervision of the whole of the classrooms and have direct access to any particular room without having to traverse the corridors. Small pass-doors are arranged between all classrooms. Two classrooms on each floor are divided by folding screens to allow of them being formed into one large examination-room when necessary. The central hall is about 48 ft. long and 28 ft. wide. Two entrances are provided at either end of the building to each department, and are conveniently arranged, giving access to the cloakrooms along a short corridor 7 ft. wide. The teachers' rooms are situated on a mezzanine floor arranged between the ground and first floor cloakooms — one to each department. The infant teachers have a small private stair from the cloakroom to their own. The junior teachers have access to their room from the half landing of the girls' staircase. A heating chamber is arranged at the low end of the site, with coal storage. A caretakers' house of five rooms, with bathroom and scullery, has also been erected. The building is faced with Commondale red facing bricks. Stone dressings are used up to the first floor, and buff terra cotta dressings to all gables and parapets. The erection of the senior block has been commenced, and will be somewhat similar in plan and design to the present block, the main front being to Brighton-road. Accommodation will be provided for 720 scholars in classrooms; and, if necessary, classes of sixty scholars each could be placed in the central halls, making a full total of 840 senior scholars, or a possible total of 1,660 scholars in the whole school. The whole of the premises are being erected from the design and under the supervision of the architect, Mr. J. Landell Nicholson, Newcastle-on-Tyne, whose plans were placed first in open competition. The work is being carried out by Mr. Thomas Hunter, of Washington, co. Durham, as general contractor, with Mr. Creighton as clerk of works, the sub-contractors being:—Concrete floors by the New Expanded Metal Co. (Messrs. Walker & Sons, Gallowgate); plumbing by Messrs. Allinson & Son, of Gateshead; slating by Mr. Charles Nicholson, Newcastle-on-Tyne; painting and glazing by Mr. Thomas Dellow, Low Fell. The heating has been executed by Messrs. Richardson & Co., of Darlington. Wrought-iron pipes and radiators are used throughout arranged on the low-pressure system. The cloakroom hat and coat fittings are of malleable iron, manufactured by Messrs. Brookes & Co., Ltd., Manchester, with wire screen divisions to girls' cloak rails. The lavatories are of Jardine McMath's Patent trough arrangement, executed in marble and supplied by Messrs. Emley & Sons, Ltd., Newcastle-on-Tyne.

NEW SCHOOLS, LOWESTOFT.—The Wesleyan Methodist trustees of the High-street Church, Lowestoft, recently purchased certain cottage property at the rear of the present school which, when pulled down, will form a good site for new schools. In a competition for new schools to be erected on this site to cost 3,000*l.*, the plans and designs submitted by Messrs. Garside & Pennington, architects, Pontefract and Castleford, were selected by the assessor, Mr. Cockrill, Borough Surveyor of Yarmouth, and they have been instructed to proceed with the work.

SWEDISH MISSION CHURCH, SUNDERLAND.—A mission church for Swedish sailors visiting the port of Sunderland is being erected at the top of James William-street, at the back of the old market. Messrs. W. and T. R. Milburn are the architects. It is estimated that the total outlay on the building will be about 1,200*l.* On the ground floor there will be a reading-room wherein Swedes, Norwegians, and Danes will find the newspapers of their countries, and rooms for the caretaker, and a vestry occupy the remainder of the floor. The whole of the upper story is devoted to a chapel, which will be 23 ft. wide and 40 ft. long, providing accommodation for over 120 people. The contractor for the work is Mr. W. B. Cooper.

VICTORIA COTTAGE HOSPITAL, MARYPORT, CUMBERLAND.—A new cottage hospital has just been opened at Maryport which has been erected as a memorial of her late Majesty, Queen Victoria. The hospital is situated on the south side of the town, and in the parish of Dearham. It is designed for ten beds, and contains a male ward, a female ward, and a separate ward for special cases, together with convalescent, operating, bath, and sitting rooms, kitchen, and three bedrooms for the nurses. The architect was Mr. Charles Eaglefield, Maryport. The contractors were:—Mr. W. Marshall, mason's work, 568*l.* 9s.; Mr. J. Kendall, joiner's work, 290*l.*; Mr. Clark, slating, 88*l.*; Mr. Kirk, plastering, 115*l.*; Mr. Thompson, plumbing, 114*l.* 11s. 9d.; and Mr. J. McKey, painting, 26*l.* 10s. 9d.

HOTEL, MANCHESTER.—The new hotel of the Midland Railway Company at Manchester is nearing completion. The four façades are in the Renaissance style, with vitrified terra-cotta mouldings above a foundation of red and grey Aberdeen granite. It is about four years since the company acquired, at a cost of about 365,000*l.*, the land on which the new building stands, and cleared from it the Gentlemen's Concert Hall, the People's Concert Hall, the Lower Mosley-street Schools, and other buildings. Then, after the contracts had been let, there were delays on questions of street lines. Something like 2½ yds. had to be given up to all the four streets which surround the plot, so that the company's area was reduced to about one and a third acres. The foundations had to be of exceptional strength, and the excavations were carried down to the red rock, and in some places to a depth of 30 ft. below the street level. In March of 1899 the operations were actually commenced and there were many delays for material. For six months the laying of strong blue bricks, faced with others of white enamel, went on out of the sight of the public, and then was seen the erection of a framework of girders—a skeleton of steel—going up apparently to a sixth story. This steelwork cost 200,000*l.* The contractors, who have never during the last six months had fewer than 1,000 men engaged on the job at once, were able at times to increase the number to 1,400 or 1,500. The main entrance will be in Peter-street, and will afford wide entrance and exit ways for carriages. A second entrance, with a portico covering the footpath, will be in Mount-street, a third entrance will be in Windmill-street, opposite the Central Station, from which to the doors of the hotel will run a covered way, and there are entrances also on the Lower Mosley-street site. The basements provide for service apartments, hairdressing saloons, baths, and other appurtenances of a modern hotel. On the ground-floor is the octagonal-shaped lounge with music balcony, covered by a dome of coloured glass, a winter-garden, a French restaurant, a general restaurant, a coffee-room, and private dining-rooms. On the first floor are provided a ball-room, lounge, and reception-rooms, suites of private-rooms — one of which will be designated "the Royal suite"—and the Gentlemen's Concert Hall. Of the 480 rooms in the hotel 400 are bedrooms. Access to every floor is by lifts. The numerous rooms in the upper portion of the building look out upon an iron balcony. The contractors are Messrs. W. Brown & Son, of Salford, and the architect Mr. C. Trubshaw. Mr. Stewart has acted for the company as building expert. The fireproof floors, ceilings, and roofs are on the Mark Fawcett system.

THEATRE, WORCESTER.—The Theatre Royal, Worcester, has been altered and restored under the superintendence of Mr. Alfred B. Rowe as architect.

LIVERPOOL INFIRMARY FOR CHILDREN.—A new Out-Patient Department, in Mulberry-street, has been erected at Liverpool in connexion with the Infirmary for Children. The building is being erected from plans prepared by Messrs. Haigh & Thompson, of Liverpool, which were accepted in competition. The new "extern" stands alone, surrounded by streets on three sides and a public passage on the fourth. The patients' entrance is at the south-west angle of the building, approached from the principal thoroughfare called Mulberry-street, and exactly opposite the infirmary. It opens into a space for the accommodation of perambulators, and through this communicates directly with a waiting-hall. The latter is placed in the centre of the building, and round it are grouped the various consulting, examining, and operating rooms. Near the entrance is a registration-room, adjoining which an isolation-room is provided. The dispensary is placed opposite the principal entrance, to the right of which are also conveniences for the women and children. At the north end of the building, next Mulberry-street, is the entrance for the staff, near which the various rooms for doctors and nurses are situated, with lavatories and other conveniences. An ophthalmic room is provided; also a store for splints, &c. At this end of the building are placed the heating cellar in the basement, and on the first floor accommodation for the keeper and his wife, with a small yard. The building generally is one story high; the waiting-hall is higher than the adjoining rooms, and above the keeper's yard (which is on the first floor), and can be lighted and ventilated on four sides. The rooms are warmed by hot water, the fresh air passing through the radiators. All windows have opening casements. The interior walls are lined with glazed bricks dado high, having round internal and external angles both horizontally and vertically. All the joints have been finished flush with Parian cement. The wall surfaces above the glazed bricks have been rendered in Portland cement, finished with a smooth surface of Parian which has been painted in white ripolin. The floors have been paved with terrazzo generally, but some with wood block and "Litosilo." The front entrance has an inclined plane without steps. All lavatories, sinks, &c., are bracketed from walls, without floor supports. Electric light has been fitted throughout. The building has been built of Accrington red bricks, with Darley Dale stone dressings, the roofs being slated. The contractors of the new building were Messrs. Holme & Green; the warming is by Messrs. Killick & Cochran; the terrazzo floors by Messrs. John Stubbs & Sons; metal casements, railings, &c., Mr. George Wragge; electric lighting, Messrs. Harford & Co.; plumbing and painting, Messrs. Cottrill & Beszant; the sanitary fittings by Messrs. Doulton; slating and plastering, Messrs. Tanner & Son. In January last year the Committee advertised for competitive plans from architects who have had experience in hospital work for the new infirmary buildings. After consideration, the scheme submitted by Messrs. Haigh & Thompson has been selected as being, in the opinion of the Committee, the best solution of the problem. The building, which is to be erected on the old site, is designed on the pavilion plan — one pavilion running north and south on the Mulberry-street boundary of the site, and the other having a corresponding aspect, parallel to the Liverpool Gymnasium, but 27 ft. away; the south gables of both pavilions will come up to the Myrtle-street boundary line. Between these wings is placed the administrative block, facing Myrtle-street, but set back, with the principal entrance in centre. The nurses' home is arranged on the St. Mary's Recreation Ground boundary, but is connected with the main central block by a "conservatory bridge." The pathological department is situated in the north-west angle of the site, and the boiler-house and detached isolation block on the rear boundary. There are five main wards in the pavilion blocks for twenty cots each.

FOREIGN.

FRANCE.—In excavating for the third line of the Paris Metropolitan Railway, on the Place de la Republique, remains have been found of a bridge, probably built under the orders of Richelieu, over the ditch of the fortifications of Charles V. ——Important decorative works are shortly to be commenced at the new Mairie of the Xth Arrondissement (Paris), designed by the late Architect Rouyer. About 100,000 fr. is to be spent on interior sculpture and painting.——The new Ecole des Arts et Metiers at Paris is to be built on a site of 20,000 square mètres, adjoining Boulevard d'Hôpital, Rue Pinel, and Rue Villejuif.——The Municipality of Reims has opened a competition for a monumental fountain at the junction of Place d'Erlon and Rue Buirette, to cost 150,000 fr. ——The old College of Roubaix is to be rebuilt and the Turgot Institute transferred to it.—— The Municipal Council of Bordeaux has decided on the construction of two moving bridges ("Ponts transbordeurs") over the Garonne, one in front of the Place Richelieu, the other, lower down the stream, opposite the Cours du Médoc. It is regretted that the Council has decided on a course which will have the result of destroying the fine perspective of the Quai de Bordeaux and of the Douane and the Bourse, both buildings the work of the architect Louis.——The jury in the competition for the Edmond Labarre Prize, of which the programme was "Une Faculté des Sciences," has awarded the prize to M. Jausseley, pupil of MM. Daumet and Esquié.——The centenary of the transference of the translation of the Academié de France to the Villa Medicis is to be celebrated by a fête in Paris.——The Chamber of Deputies is concerned with a project for

a metropolitan railway from Auteuil to the Opera. There is also talk of prolonging the metropolitan line to Clichy as far as the outer boulevards.——The "Vieux Paris" Committee has demanded the restoration of the paintings which decorate the porch of the church of St. Germain l'Auxerrois, but with the condition that the work should be carried out in fresco and not in oil painting.——The death is announced, at the age of 63, of M. Desiré Goubet, engineer, and inventor of a submarine boat that bears his name.

A NEW CATHEDRAL FOR BOMBAY.—It is proposed to erect a new cathedral in Bombay. Mr. J. Begg, the Consulting Architect to the Government, has already prepared sketch plans of the proposed cathedral, and it is roughly estimated that the building would cost to erect Rs. 6 lakhs.

CHINA.—As a part of the atonement of the Chinese Government for the murder of Baron von Ketteler, it was arranged that a memorial arch should be erected in Pekin. This has now been done, and the edifice was formally dedicated by Prince Chun on the 18th inst.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Messrs. Pugin & Pugin, architects, have removed their offices from 12, Paradise-street to 51, North John-street, Liverpool.

ROYAL ACADEMY.— Sir Ernest Waterlow and Mr. John F. Bacon have been elected Academicians; and Mr. W. R. Colton and Mr. Arnesby Brown Associates.

THE EDUCATION OF AN ENGINEER.—The fifth meeting of the twenty-ninth session of the Liverpool Engineering Society was held on the 14th inst. at the Royal Institution, Colquitt-street. Mr. Ernest S. Wilcox (President) occupied the chair. During the evening a paper was read by Mr. A. F. Fowler, M.I.C.E., M.I.M.E., on "The Study of Engineering from a Business Point of View." Mr. Fowler said that he wished to consider the subject from the point of view of any one who decided to make his living in the profession, and who wished to be qualified as quickly as possible. He said that many persons of judgment were now mentally inquiring if the education of engineering students to-day was not being conducted too much on the lines of research and excessive technique. Did it not tend to narrowness, and did it, as it ought, develop the observant faculties and the habit of thinking for oneself? These queries appeared to reflect upon the discretion of the purely professional engineer, but they were really inquiries as to whether or not science was taught with discrimination and regard to the interests of the student. A considerable knowledge of mathematics and physics was indispensable; chemistry and geology were desirable; but after a good groundwork in these subjects had been learned at school, their further study might be confined to their application to the work taken up at the office or workshop, and to assist the student to attain the all-important quality of thoroughness. This, of course, referred to those students who had entered offices or workshops, and not to the comparatively few who elected to become pure scientists.

ALL HALLOWS, LOMBARD-STREET.—At a general meeting of the London and Middlesex Archæological Society, held on the 13th inst., great concern was expressed at the news that a commission had been appointed by the Bishop of London to consider the union of the parishes of St. Edmund the King and the Martyr with All Hallows, Lombard-street, and with the further proposal to pull down the Church of All Hallows, and to sell the site. The following resolution was passed in relation to this subject:—"That the Society expresses its astonishment and regret at the proposal to destroy a church of such exceptional beauty and interest as All Hallows, Lombard-street, and trusts that the parishioners of that parish will withhold their consent from any scheme that contemplates the destruction of their church. That a copy of this resolution be sent to the Churchwardens of All Hallows Parish, and to the Bishop of London."

INCORPORATED SOCIETY FOR PROMOTING THE ENLARGEMENT, BUILDING, AND REPAIRING OF CHURCHES AND CHAPELS.—This Society held its usual monthly meeting on the 15th inst., at the Society's House, 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at Broughton Moor, St. Columba, near Cockermouth, Cumberland, 80*l.*; Holloway, Christ Church, near Matlock Bath, Derby, 90*l.*, in lieu of a former grant of 80*l.*; East Kirkby, St. Thomas, near Kirkby-in-Ashfield, Notts, 50*l.*; Egremont, St. Columba, near Liverpool, 80*l.*; Grimethorpe, St. Luke, near Barnsley, Yorks, 60*l.*; Hilderthorpe, Emmanuel, near Bridlington, Yorks, 40*l.*; Hucknall-Huthwaite, near Sutton-in-Ashfield, Notts, 40*l.*; Renishaw, St. Matthew, near Sheffield, 30*l.*; Rock Ferry, St. Barnabas, near Birkenhead, 135*l.*, and York, St. Barnabas, 25*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Chipping Warden, SS. Peter and Paul, near Banbury, Northants, 25*l.*, and Danby, St. Hilda, Yorks, 15*l.* A grant was also made from the Mission Buildings Fund towards building a mission church at All Stretton, near Church Stretton, Salop, 50*l.*, in lieu of a former grant of 40*l.* The following grants were also paid for works completed:—Pelsrey, St. Mary and All Saints, near Walsall, Staffs, 1,000*l.*; Ravensthorpe, St. Saviour, near Dewsbury, Yorks, 200*l.*; and Hoxton, St. John the Baptist, Middlesex, 40*l.* In addition to this, the sum of 301*l.* was paid towards the repairs of eighteen churches from Trust Funds held by the Society.

YORKSHIRE BUILDING TRADES' FEDERATION.—The annual dinner of the Yorkshire Federation of Building Trade Employers was held on the 15th inst. in the Building Trades' Exchange, Sheffield. There were about 120 guests. Mr. J. Dawson (Huddersfield), President of the Federation, was in the chair. After the loyal toasts, Mr. S. Smethurst (President of the Lancashire, Cheshire, and North Wales Federation) proposed "The Yorkshire Federation." Those Federations were not institutions that were intended to promote strife—he believed they minimised it. If builders were thoroughly organised they could arrange differences and eliminate grievances without resorting to force, a brutal system of fighting which ought to be out of date. He urged the value of the intertrading method which had been adopted in Lancashire with great success. In towns where it was in operation members of the local associations pledged themselves not to deal with any one who was not also a member. The result was more than to double the membership in every case, and immensely to increase the strength of the Federation. He hoped Yorkshire would in this matter follow in the footsteps of Lancashire.— Mr. Mansfield (York) responded first. He congratulated the Yorkshire Federation and the Northern Centre on the amount of work it had done in showing that only reasonableness was wanted, and thus avoiding strikes. The Federation existed to see mutual justice between master and man.—Mr. E. R. Good (Hull) further replied. The text of the Federation was "Freedom of employment," and he urged them to carry it out. If they did so, they would get a fair return for their money. He was not antagonistic to trade-unionism, but the practice of unionism had not in any sense approached the ideal of its title during the last fifteen years.—The President also spoke in acknowledgment of the toast. The Federation, he said, believed in upholding the doctrine that this was a free country, and that a man could sell his labour for the best price he could get. Builders did not want to put the workman down; in fact, two years ago, when trade began to fall, a resolution was passed advising members not to reduce wages, but rather to attempt to remove unreasonable rules that the men had insisted upon. The Federation had done good service by preventing strikes. They had had to take action in order to break down the indignity and oppression that the men had practised for twenty years, until they thought that they could do as they liked. They had taken five cases in the last four years, and one of the earliest settled the question of picketing, Mr. Justice Stirling granting them an injunction. He spoke of the other cases, which had shown that the law would defend the employer as well as allow the workman his liberty. He welcomed the recent decision in the Taff Vale case, which had shown that damages could be obtained from the unions, and said its result would be fewer strikes and more reasonable demands than they had had in the past.—Mr. A. Sinclair (Scarborough) proposed "The City and Trade of Sheffield."—Mr. W. H. Lancashire, who was the first to respond, expressed the opinion that Sheffield was going too much into the building trade. He had never been in favour of the Works Construction Committee. With the large undertakings that the Corporation had in hand they could afford to dispense with that altogether. Let them be content with bringing such undertakings to perfection, and then stop, and allow private traders a fair chance of getting a living.—Mr. J. Longden, also replying, said builders preferred to pay good wages if they could get an equivalent amount of work done. Unfortunately, the pay had increased, and the work had decreased. It had been necessary to form organisations of builders, and a better understanding between employer and employed was now growing.—Mr. A. Muir Wilson, who further responded, condemned the Works Construction Committee as a sham, a farce, and an iniquity, and said he intended to propose its dissolution, as it was an encroachment upon the rights of private trading.—Mr. J. Wright (Nottingham) proposed "The National Association." He said the master builders did not want to interfere with trade-unionists in their right to combine and sell their labour at the best price; but if the unionists would not work they did not want them to interfere with those who would or with the masters. He urged that to make the National Association successful there ought to be a national managing secretary, a head office, and a national building journal.—Alderman Jessop (treasurer of the National Association), in reply, described Mr. Wright's suggestion as capital. He also said the builders would hail the day when a Minister of Commerce was appointed, with a seat in the Cabinet. He regretted that only 20 per cent. of the building trade employers of the country belonged to the Association.—Mr. Cooper (Derby) also responded.—Mr. W. Judge, Wakefield, gave "The Sheffield Association."—Mr. J. Biggin, President, in reply, said the Association had been brought up to date, and was one of the most vigorous in the country. They had done their best to show to every builder in Sheffield the advantages of membership. The day of individualism was past; an individual employer could not cope with the united and arbitrary actions of the men.—Mr. Hodkin also responded.—The other toasts were "The Architects and Surveyors," proposed by Mr. P. Rhodes (Leeds), and acknowledged by Mr. A. F. Watson; and "The Visitors," given by Mr. A. J. Forsdike, and responded to by Mr. Walker (Derby) and Mr. Edgar (Nottingham).

MANCHESTER MASTER BUILDERS AND THE "FAIR CONTRACTS" CLAUSE.—On the 15th inst. the Manchester Watch Committee listened to the reading of correspondence which has been addressed by the Manchester and Salford Master Builders' Association to the Town Clerk with respect to certain contracts which are being let for the foundations of the new police and fire station in London-road. Mr. J. Tomlinson, the Secretary of the society named, writing from the offices of the organisation in Cromwell-buildings, Blackfriars-street, on December 23, said that the members of the Association are of opinion that the new conditions introduced into the contract would have wider and more far-reaching effects than the Corporation either intended or anticipated. They regretted that they could not tender for any work under the proposed conditions, but would be pleased to confer with the Watch Committee or its officials. Writing again on the 6th inst. under instructions, the Secretary traversed the various details of the fair contracts clause. The members of the Association, he said, object to the demand of the Corporation that the contractors "must pay the standard rate of wages to the whole of their workpeople, and observe the hours of labour recognised by the local organised bodies of workers in the various trades affected in the district where such work is being executed." By this clause, the letter urges, a contractor having a job in Manchester for the Corporation would be required to pay the wages recognised by the Manchester trade-unionists to the whole of his workpeople wherever they might be employed; and whilst a Manchester employer could be required to pay Manchester wages to the men whom he employs in other towns where wages are much lower, an employer, say, at Stockport, Bury, or Preston should be required to pay his local staff at the Manchester rate if he had a Manchester Corporation contract, thereby handicapping employers who are working for the Manchester Corporation. In the second place, it is objected that the words "organised body of workers" place it in the power of any organised trade society to fix their own rate of wages and hours of labour, and that if a contractor has signed the clause he could be forced by the Corporation to observe such rates of wages and hours of labour or run the risk of having his contract cancelled. Thus the employer would have no voice in fixing wages and hours, as particular agreements with the operatives in the building trades cannot be enforced by law, and there could be no resisting the men's demands by strikes or lock-outs, as this would practically mean giving up the contract. The letter went on to speak of the number of old men who are not able to do a full day's work, and who are, by recognised custom, paid lower than the standard wage. Under the clause the Association alleges that these men could be no longer employed except under risk of a cancelled contract. Further, the master builders object to the demand that the principal contractor should be responsible for all work executed by himself, not, as they say, as it applies to responsibility for quality of work, but in respect to its application under the first part of the clause previously objected to. Also they object to the onus of proof being thrown upon the contractor in the case of any vexatious complaints made by the labour delegates or other irresponsible persons. Although they might find no difficulty in showing compliance with the conditions so far as their own workpeople were concerned, probably in the case of sub-contractors and others the difficulty would be so great that they could not pledge themselves to undertake the responsibility. The master builders also object to the City Council having a voice in approving of the sub-contractors. They contend that the contractor is best fitted to decide as to who shall be his sub contractors, and in support of their position it is urged that neither the Government nor railway companies seek to impose such conditions upon contractors. Finally, the Association are opposed altogether to the very drastic penalty which the Corporation asks power to enforce, perhaps for what might be a trivial offence. After hearing the foregoing letters read the Watch Committee decided that, as the situation had been created by the City Council in adopting the fair contracts clause, the correspondence should be laid before the Council at its next meeting, with a request for direction upon it.

LONDON STREETS.—At a meeting of the Westminster City Council on the 15th inst. at the City Hall, Charing Cross-road, Captain Jessel, M.P., the Mayor, presiding, it was resolved to establish a labour exchange at Caxton Hall, Caxton-street. The Works Committee recommended, and it was resolved:—"That a communication be addressed to his Majesty's Government, suggesting that the Royal Commission about to be appointed to inquire

into the congestion of traffic in the streets of London be directed to receive evidence and report upon the obstruction caused by the breaking up and use of the streets by companies and other undertakers under statutory powers to lay pipes, wires, &c., and execute works over, under, across, and along the streets; and also as to the advantage and practicability of requiring such pipes, wires, works, &c, to be placed in subways under the streets." The same committee submitted recommendations to the effect that no street should be flushed when the temperature is lower than 32 deg. Fahr., or when the application of salt would be necessary after flushing, that ballast be sprinkled on the roads after flushing, as and when required, and that roads with steep gradients be ballasted every morning during wintry or greasy weather. Mr. McConnell said that the regulations of the Council regarding flushing and ballasting had been disregarded, and, in order that the responsible officials might be brought before the Works Committee with a view to their dismissal, he moved that the whole matter be referred back to that Committee. Mr. Everitt seconded the motion, which was agreed to. It was resolved to plant trees in Whitehall and Parliament-street from Horse Guards-avenue to Bridge-street on both sides of the roadway. Sir John Wolfe-Barry, a member of the Council, undertook to give the trees, and an estimate of 220*l.* 5*s.* for planting them and supplying grids, guards, and kerbs was approved.

THE BUILDING ACT AND THE CITY.—At the meeting of the City Corporation on the 15th inst. at Guildhall, the Remembrancer drew attention to the London County Council's London Building Acts Amendment Bill. Mr. Lobb said the Bill was an echo of the Queen Victoria-street fire. He was therefore surprised that, instead of providing more efficient apparatus, they should put upon the individual occupier the expense of providing that protection. Mr. Morton said the Bill was framed in the interests of the workers in the City, but he thought they might get over an apparent difficulty by endeavouring to make the Corporation the authority to putting the Act into force. Mr. Deputy Baddeley said he was convinced that the Bill would diminish the ratable value of the City and put owners and occupiers to enormous expense. He moved, and it was agreed, that the Bill be referred to the Streets Commissioners, with instructions to confer with the City Lands and Bridge House Estates Commissioners, in order that steps might be taken as those Commissioners might deem necessary in the interests of the ratepayers.

QUEEN VICTORIA MEMORIAL IN SHEFFIELD.—The Executive Committee of the Queen Victoria Memorial in Sheffield held a meeting at the Town Hall on the 16th inst. to consider suggestions from the artist, Mr. Alfred Turner, of Kensington, that improvements should be made to the design for the memorial, involving additional cost. The Chairman (Alderman Eaton) explained that the artist suggested that the pedestal and the figure of the Queen should be increased in height, and a letter was read from Mr. Turner, stating that he had sent the drawings of the pedestal, as amended by Mr. E. W. Mountford, and they would see that the total height was now 32 ft. 6 in., as against his original height of 25 ft. That the added 7 ft. 6 in. had greatly enhanced the dignity of the memorial was the opinion of all artists who had seen the designs. Mr. Mountford would also like to see the two panels under the cornices continued round the memorial in the form of a freize. Having gone carefully into the expenses, he begged to suggest that another 1,000*l.* be added to the original 3,000*l.* to enable him to carry out these improvements. Any practical man would bear him out that the 3,000*l.* left no margin at all for any improvements.—The City Surveyor (Mr. Wike) said he had received a further letter from Mr. Turner, stating that the additional 5 ft. to the pedestal meant a considerable increase in the expenses; while the alteration from the 9 ft. to 11½ ft. (which was imperative now that the height of the pedestal was increased, or the Queen would look foolishly small) would increase the expenses of bronze casting quite double the amount. The original design would cost him fully the 3,000*l.*, as also would the amended one—if approved—the extra 1,000*l.* A sub-committee having been appointed, the meeting terminated.

HOLBORN TO STRAND IMPROVEMENT.—The Improvements Committee of the London County Council reported on Tuesday that in regard to the Holborn to the Strand improvement considerable progress has been made. The Council is now in possession of the whole of the property between Catherine-street and the Law Courts on the Strand frontage, as well as most of the land needed for the formation of the new crescent road, and nearly all the houses have been demolished. The Act of 1899, which authorises the construction of the new street from Holborn to the Strand and the widening of the Strand east of Wellington-street, makes provision for the reinstatement of the Gaiety Theatre, Gaiety Restaurant, and Messrs. Shorts, Ltd., at the western end of the site which will be formed between the new crescent road and the Strand, and the Council has given its approval to a design by Mr. Ernest Runtz, based on Mr. Norman Shaw's sketch-design, for the elevation of the new theatre and restaurant proposed to be erected on the site in question, and the company have made much progress with the new building. The Act also makes provision for the reinstatement of Carr's restaurant on the north-eastern frontage of the proposed crescent road close to the Law Courts, and the Council approved an elevation for the new restaurant, which is now nearing completion. The work of forming the new street from Holborn to the Strand and clearing the insanitary area at Clare Market is being undertaken as one scheme. In the Clare Market area about 3,038 persons of the working class were displaced, and the scheme sanctioned by the Home Office was that accommodation should be provided for 750 persons on the cleared land at Clare Market and for 1,500 persons at Millbank. For the new street about 3,700 persons of the working class will be displaced, and the scheme sanctioned by the Home Office is that accommodation shall be provided as follows: 250 on the Duke's-court and Marquis-court sites, 799 in a lodging-house in Drury-lane, 1,681 on the Reid's Brewery site, 680 on the Herbrand-street site, and 290 at Millbank. In carrying out the complete scheme of improvement it will be necessary to acquire in all forty-nine licensed houses, and the Council has decided to continue the policy hitherto maintained and to abandon those licences. The widening of Southampton-row between High Holborn and Eagle-street has been completed, and the widening of the remaining portion of that thoroughfare will be undertaken at an early date. The formation of the portion of the new street immediately south of Holborn will be undertaken in the course of two or three months. The work of widening the Strand has involved the acquisition of portions of the churchyards of St. Mary-le-Strand and St. Clement Danes. The Act requires the Council to undertake the removal and reinterment of all human remains which may be found in the parts of the churchyards required for the improvement. The Council accordingly made arrangements for the removal of the remains and their reinterment in the consecrated portion of Brookwood Cemetery. All the work connected with the widening of the Strand from Catherine-street to the Law Courts has been completed, including the new sewer and the subway for pipes, wires, &c. The work connected with the formation of the eastern portion of the new crescent road, which will begin at the Strand close to St Clement Danes Church and will re-enter the Strand at Catherine-street, has been commenced.

ALL HALLOWS, LOMBARD-STREET.—At a general meeting of the British Archæological Association, held on the 14th inst., the following resolution was unanimously passed:—"That the members of the British Archæological Association hear with deep regret of the proposed demolition of All Hallows, Lombard-street, one of the group of churches erected by Wren after the Fire of London, and one which may claim to possess an interior hardly excelled in London, among churches of the seventeenth century. The richness of the carved woodwork and the subordination of ornament to structural needs render it specially worthy of preservation, in the estimation of all who value the productions of the master-mind of its architect and desire to retain the few remaining links between past and present times."

THE SLATE TRADE IN 1902.—During the past year there has been a very brisk demand at remunerative prices, especially for the better qualities of slate, and this shows every prospect of continuing, as all stocks are very low. In a few districts the building trade has not been so brisk, but the steady falling off in output counterbalanced this. Also the importation of American slates largely diminished, owing to increased demand in the States and higher freights. New companies have been formed to work some of the smaller undertakings, and slate quarries are gaining favour with investors owing to the prosperous state of the trade. Except the Penrhyn strike, there have been no labour troubles, nor any important cases under the Workmen's Compensation Act.

STREET PAVING IN GLASGOW.—A report by a deputation of Glasgow Corporation who visited London, Liverpool, St. Helens, and other cities, on the conduits and smooth paving of the streets of those cities was submitted at a meeting of the Corporation on the 19th inst. The members of the deputation recommended that in view of the widening and improvement of Nelson-street an experimental and well-ventilated conduit for the reception of all service pipes, cables, or wires, should be constructed. They are also of opinion that in streets without tramways, in and near to the business parts of the city, and in main thoroughfares through the suburbs, in which there is more or less continuous traffic, and where the gradient is not steeper than, say, 1 in 55, the paving thereof should be of asphalt. Their view is that there should be throughout the city a very great extension of asphalt paving. Where, in the same class of streets, the gradient is, say, between 1 in 55 and 1 in 40, the paving should be of hard wood, and in such class of streets there should also be a considerable extension of that class of paving. Again, in the same class of streets, where, however, the gradient is steeper than 1 in 40, the paving thereof should, according to circumstances, be square-dressed setts, either of granite or of whin. Where, in such streets as have been described, there are tramways, and where the gradient is not steeper than 1 in 40, the paving thereof should, if possible, be of asphalt or hard wood, but the case of each such street would require to be considered on its particular merits. In the case of those streets in the central and other districts of the city where there are no tramways and where the other traffic is not great and which are more or less of a residential character, the paving thereof should, according to gradient, be of asphalt or hard wood, unless that gradient is so steep as to render the adoption of smooth paving inadvisable. In suburban streets of a main or important character, and which may or may not have tramways, the paving should also be of asphalt. In the less important of those streets, the paving (where the gradient is not clearly unsuitable) should probably be that of tar macadam, and in the remaining streets having little or no vehicular traffic, the paving should be that of ordinary macadam. Where smooth paving is adopted, all the pipes and cables of the various departments of the Corporation, and those of the Post Office, and others should, in some systematic manner, be laid in lanes or in the footpaths, and not in the roadway.

MEMORIAL WINDOW, MONTGOMERY CHURCH.—In the Parish Church, Montgomery, recently, a stained-glass window, introduced by the Mayor (Mr. Nicholas Watson Fairles-Humphreys) in memory of his wife (the late Mrs. Maria Micaela de las Mercedes Fairles-Humphreys), and her father (the late Mr. Richard Smith Humphreys), was dedicated. The work was designed and drawn by Mr. Charles Hean, of Kemsing, Sevenoaks, and executed by Mr. George Lloyd-Maerchant, of London. The chief subject is the "Nativity of our Lord." The representation occupies the three central lights. The window has been placed in position by Mr. Maurice Jones, of Montgomery, and his assistants, under the supervision of Mr. Arthur A. Reeves, of London. Outside, a guard of copper wire has been fixed to protect the glasswork from injury.

KINGSBURY (MIDDLESEX) SEWERAGE.—At the invitation of the Urban District Council, Sir Ralph Littler, Chairman of the Middlesex County Council, opened the new sewerage works at Kingsbury on Saturday, the 17th inst. Under the first contract nearly four miles of cast-iron and stoneware pipe sewers have been constructed. Concrete tubes being used for the manholes. The main outfall sewer is 15 in. diameter and, in order to obviate the necessity of two outfalls or pumping, is laid at a considerable depth, being over 40 ft. deep in places. The cost has been nearly 10,500*l.*, and a further expenditure of 9,000*l.* will be necessary to complete the scheme. Mr. S. Slater Grimley, Engineer to the Hendon Urban District Council, is the consulting engineer, under whose direction Mr. Clift Ford, contractor, Harlesden, has executed the works.

CAPITAL AND LABOUR.

PLASTERERS' STRIKE AT LLANDUDNO. — A Birmingham firm is erecting a large convalescent home at Llandudno, and the work was well advanced when the local plasterers, who were receiving the current local rate of wages, demanded that they should be paid on the Birmingham scale of 10d. instead of 8d. an hour. It was represented that they were asking what was unreasonable, and that, though the contractors were a Midland firm, they were paying the local men the regular trade union rates. However, the whole of the Llandudno plasterers struck work; the operations were partially suspended as the result. The contractors have now imported all the labour they require from the Midlands, and the local men are left idle.—*Liverpool Post.*

LEGAL.

BUILDING DISPUTE AT LEICESTER.

THE case of Blackler *v.* Wright came before Mr. Justice Ridley and a special jury in the King's Bench Division on the 14th and 15th insts.

This was an action by Mr. Andrew Blackler, trading as A. W. Blackler & Son, of the Royal Marble Works, St. Mary Church, Devon, to recover the sum of 658*l.* 18*s.*, balance of an account of 1,542*l.* 3*s.* for work done and materials supplied to the defendant, a builder and hotel proprietor of Leicester. The defendant disputed 111*l.* of the plaintiff's claim, which was charged in respect of architect's fees for getting out quantities, and counterclaimed for 480*l.* damages for loss sustained through the alleged failure of the plaintiff to complete his contract by the specified time. The plaintiff, in reply, denied that he undertook to complete the work by any specified time.

Mr. Eldon Bankes, K.C., and Mr. Clay appeared for the plaintiff; and Mr. Samuel T. Evans, K.C., and Mr. Disturnal for the defendant.

Mr. Bankes, in opening the case, said the plaintiff was the proprietor of marble quarries and works in Devonshire. Defendant was the proprietor of the Grand Hotel, Leicester, and he decided in 1900 to make extensive additions to it, including a winter garden and a banqueting-hall, to be called the King's Hall. He decided this was to be a very handsome hall, 85 ft. long, some 30 ft. wide, the

walls to be lined with marble, in addition to some twenty marble pillars. After some negotiations, Mr. A. Hall, architect and surveyor, of Leicester, was engaged to act as architect, and he, as country architects often did, got out the quantities himself instead of employing a quantity surveyor, and invited contracts for the work, instructing the parties tendering to include in their tenders 106*l.* for his quantity fees and 5*l.* 15*s.* for the cost of lithographing the quantities. The original scheme was a very ambitious one indeed, and the first tenders were for something like 4,000*l.* Plaintiff sent in his tender and included the architect's fee, but the original plan was subsequently modified, and ultimately the work carried out by the plaintiff was reduced to 1,542*l.* 3*s.* But the architect, according to custom, was entitled to his fees upon the full amount of the original quantities taken out by him, and it was a curious thing that in an action which Mr. Hall, the architect, was bringing against the defendant, the latter had made an affidavit in which he claimed credit for the difference between the fees on the 1,542*l.* and the sum claimed by the plaintiff in this case—an inconsistency with the present defence, which was that he was not liable for any part of those fees. But the defendant was a man who liked to have his own way, and if he did not have it those in any way connected with him heard of it. But in these courts he must be guided by the ordinary rules. As to the allegation of the defendant that the plaintiff had contracted to complete the work by May 1, 1901, plaintiff would tell them that he never contracted to complete the work by any specific date, and that he told the architect when it was proposed to increase the height of the pillars from 5 ft. to 7 ft. some inches, that he could not possibly complete the work by May 1, nor could he promise to complete it by any particular date, as he should have to quarry marble specially for the pillars, which were longer than were to be found in one piece in any building in the country, save one. Plaintiff only promised to use all possible speed, and this he had done, and in fact he had completed the work before the winter garden and the staircase by which the hall was approached were completed, so that the defendant could not have suffered any loss by the delay in completing the marble work in the banqueting-hall. He was not therefore entitled, counsel contended, to the damages claimed by way of counterclaim.

Plaintiff was then called and bore out his counsel's opening statement.

Mr. Amos Hall, architect, gave evidence of a corroborative nature. He stated that he was architect for the hotel and acted as defendant's agent in ordering the marble for the banqueting-hall.

Cross-examined:

He wrote several letters to the plaintiff pressing him to complete the work by May 1, 1901, but they were written at the instance of the defendant, who was "jumping" on people all round because the hall was not finished as soon as he wished. In point of fact the plaintiff had not undertaken to finish the work by any specified date, but had promised to push it on as quickly as possible. He considered that the plaintiff had completed the work in a reasonable time, considering the difficulty to obtain the marble for the columns.

Re-examined as to the fees for quantities, it was the custom of the trade for contractors to charge them on the full amount for which they were originally taken out. The quantities were submitted to the defendant and his manager before being sent out, with the paragraph at the bottom requesting the parties tendering to include fees for quantities.

For the defence the defendant was called and was giving evidence as to the loss he had sustained through the delay in completing the building, when Mr. Bankes interposed and said he had not been supplied with particulars. If the point was insisted upon there must be a reference as to the amount, if it was decided that plaintiff was liable.

This was agreed to by Mr. Evans on behalf of the defendant.

In cross-examination defendant admitted that it was the custom of the trade for the contractor to charge the fees for taking out the quantities on the full amount, but in this case he had a special arrangement with Mr. Hall. He admitted that the plaintiff was not aware of that arrangement till after the completion of the work. Defendant did not charge the plaintiff and Mr. Hall with conspiracy, or with suppressing letters, but Mr. Hall had led him to believe that plaintiff must finish his work by May 1.

Other evidence was given on behalf of the defendant.

Counsel having addressed the jury, his Lordship in summing up said he could find no foundation whatever for the charge of fraudulent conspiracy which was implied in the first instance. He left to the jury the question whether there was a contract to finish by a specified date, or only in a reasonable time, and also as to whether the fees for taking out the quantities ought to be paid on the smaller or larger amount.

The jury, without leaving the box, found for the plaintiff on both issues, and also on the counterclaim.

Judgment was accordingly entered for the plaintiff on the claim and counterclaim with costs.

BUILDER'S ACTION FOR LIBEL.

THE case of Dandridge *v.* Hayles came before Mr. Justice Ridley and a special jury in the King's Bench Division on the 19th inst., an action by the plaintiff, a builder and contractor, against the defendant, also a builder and contractor (both carrying on business at Shanklin, Isle of Wight), to recover damages for libel. The case for the plantiff, Francis Dandridge, was that in April, 1900, the Sandown Urban District Council decided to have Wilton-road, Shanklin, in which the defendant, George Hayles, resided and owned property, sewered, levelled, metalled, and put into proper repair. Plaintiff tendered for the work, and obtained the contract, which was, he said, properly carried out under the supervision of the Surveyor of the District Council and his clerk of the works. While it was proceeding the defendant wrote a letter to the District Council containing the words complained of, in which he imputed that the contract was being carried out in a "barefaced scamping manner," and complained of a deficiency of ballast, &c. The Town Council inquired, and found the complaint was groundless, but the defendant still persisted in his allegation, and resisted the payment of his proportion of the cost as frontager on the ground that the work was not properly executed. He was, however, ordered to pay the amount to which he was assessed by the magistrates, and on appeal to the King's Bench Division was unsuccessful. The letter was read out at the Council meeting and made public, and had, plaintiff said, done him a great deal of injury, and, therefore, he brought the present action. The defendant pleaded that he wrote the letter *bona-fide* as a ratepayer and frontager, and that, therefore, it was privileged.

Sir Arthur Collins, K.C., and Mr. Turrell appeared for the plaintiff; and Mr. Montagu Lush, K.C., and Mr. Marriott for the defendant.

Evidence having been given in support of the plaintiff's case, it was proposed on behalf of the defendant to call evidence to show that the work was not carried out in accordance with the specification, but that course was not followed, as his lordship said that such testimony could not affect the question raised by the case, which was whether the plaintiff had satisfied the surveyor, as it was said he had done. The case for the defendant, therefore, rested on the plea of privilege and the absence of malice.

In the result the jury awarded the plaintiff 50*l.* damages, and judgment was entered accordingly.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

2,518 of 1902.—H. H. HODKIN: *The Combination of a Sink, Boiler and Bath.*

This consists in the combination of a sink of enamelled iron capable of being turned up on one edge, and a bath fixed underneath said sink with or without a special water boiler.

2,698 of 1902.—C. A. JONES: *Method of Providing Compensation for Shrinkage of Boards in Table Tops or other Surfaces Consisting of more than one Board.*

A method of providing compensation for shrinkage of boards in table tops or other sufaces consisting of more than one board and consists in the use of longitudinal strips fastened along the joints on the underside of the boards.

2,934 of 1902.—W. BAILEY AND H. C. ASKWITH: *Clamp or Brace for Binding or Securing the Joints of Chairs, Couches, or other Articles of Furniture.*

Binding and strengthening the joints or corners of chairs and such like articles of furniture by means of a clamp consisting of a piece of metal of angle or L-shape, and a bolt or the like, together with a nut or not as desired.

3,117 of 1902.—R. LEGGOTT: *Apparatus for Operating Fan Lights.*

An apparatus for operating fan lights, and consists in the combination with a quadrant having indents or recesses therein, of a lever, having a handle, and locking lever.

3,122 of 1902.—F. CLAYTON: *Recessing or Grooving Planes.*

This plane consists of a suitable frame or body, preferably having two handles, and fitted with five tool holders in suitable positions on the frame, the tool being interchangeable, and being held in position in any desired holder so as to be adjustable vertically therein by means of a loose collar and thumbscrew. Right and left side tools are provided, and a suitable bottom tool. A right or left hand slide is fitted beneath the frame or body of the plane, this slide being secured and adjusted by means of a pin and screw working within a pair of oblique slots. The cutting-tool passes through a side opening in the said slide, the amount of cut being regulated by tapping the slide at the ends. The slide may be removed when not required by slackening the screw, and withdrawing the pin and screw from their respective slots, a suitable opening in the frame being provided to allow for the insertion and withdrawal of the screw head. The slides are interchangeable and adjustable in two or more pairs of slots, and as the various tools are interchangeable and adjustable in the several toolholders the plane can be adapted to a large variety of work, the requi ed tool being fixed in the holder best suited to the purpose.

* All these applications are in the stage in which opposition to the grant of a Patent upon them can be made.

3,147 of 1902.—H. E. HUGHES: *Latches or Fastenings for Doors or other Purposes.*

This consists in the combination with a handle on one side of the door, of a lever so pivoted thereto that the handle and lever can be grasped at one and the same time, a lateral arm projecting from said lever, and passing through the door immediately under the latch and projecting a little to the other side, the lever and handle being both so arranged as to be capable of being grasped by one hand, whereby when the hand grasps the handle to open the door it at the same time opens the latch.

3,291 of 1902.—A. DOMAN: *Springs for Doors or Flaps.*

This consists in the combination with a coiled spring, of a rod or pivot having a collar or projection perforated or slotted to receive a pin locking the said rod to its support or carrier.

5,191 of 1902.—J. S. FLINT, H. C. KEY, and E. E. MASON: *School and Other Desks.*

This consists in the combination of a fixed desk or board, and of a movable hinged, jointed, or linked supplementary top or board free to move on such hinges, joints, or links to render it adaptable for various purposes and positions.

10,496 of 1902.—E. PEARSON: *A Device for Fixing Knockers, Handles, and Other Door Furniture, so as to be easily and readily detached.*

A means for securing door knobs, knockers, and such-like articles, and consists of a recessed nut engaging on the screwed end of handle or other spindle or bolt, a pivot section engaging with recess in said nut, and carried by the usual rose or plate, and a spring holding said pivotted section or plate in position.

23,336 of 1902.—D. M. SUTHERLAND: *Millboard Panels.*

This relates to the manufacture and use as panels of millboards coated on the backs and edges with a thin metallic film, preferably laminated lead.

247 of 1902.—R. STANLEY: *Apparatus for Use in Connexion with the Manufacture of Sanitary and other like Pipes.*

This consists in the combination with extrusion machines for the manufacture of sanitary and other like pipes of a revolvable ring surrounding the mouth thereof; a removable bracket attached to said ring and adapted to be locked in operative position, and carrying a rod capable of being raised and lowered vertically, and capable also of axial movement and of being locked in position within the free end of said bracket, and a knife on said rod.

360 of 1902.—G. KIEFER: *Dust Collector.*

A dust collector having short or long passages for the current of dusty air, characterised by the arrangement, in the path of movement of the current of dusty air, of one or more inner chambers or hollow bodies of quadrangular, round, or elliptical shape, through the side walls of which chambers (said walls consisting of or including permeable material, filter stuff, smooth fine gauze, sifting cloth) the finer and finest dust is separated, whilst the velocity of the movement of the air current passing the smooth side walls of said chamber or chambers, in approaching and entering the fine meshes of the gauze or filter stuff, is continually decreased, until the cleansed air escapes free from dust.

622 of 1902.—C. V. BOYS: *Moulds for Welding Rails and the like.*

Apparatus for welding by means of thermit, and consists in the use of a metallic casing in which the mould is formed, the casing being constructed in parts adapted to envelope the parts of the articles to be welded and to clamp them in position.

2,522 of 1902.—L. WHITTAKER: *Manufacture of Bricks or Artificial Stone Blocks or the like.*

This relates to appliances for mixing materials for the manufacture of bricks or the like, and consists in the combination of receptacles for the materials and water, of proper proportionate size, valves or other closing and delivering devices to the receptacles, and connexions for operating all the said valves or other closing and delivering devices simultaneously, either by hand or automatically.

3,108 of 1902.—J. E. BURKILL and W. SUNDERLAND: *Method of and Means Employed for Connecting Pipes.*

According to this invention the ends of the pipes or sockets are cast or formed with a half V-shaped or inclined flange, and when the ends of two pipes or sockets are brought together they form a full V-shaped flange or ring around the pipes or sockets. Round the V-shaped flange are now placed two semicircular portions or segments of a clamp, which is hollow or trough-shaped on cross-section. When the two portions are placed over the joint they

are fixed together by nuts and bolts passing through lugs.

13,394 of 1902,—J. MILWARD and H. WATERSON: *Iron Brick Machine Die.*

A brick machine die formed of top, bottom, and end plates, bolted together to form a taper die in combination with shaping-pieces and angle lubricating devices.

14,126 of 1902.—R. M. MCDOWALL: *Method of Staying and Securing Rods in Armoured Concrete for Fireproof Buildings, Floors, and other Purposes.*

This relates to armoured concrete floors for fireproof buildings and other purposes, and consists in a particular construction of same, comprising bars having a series of clips formed therein, and adapted to clip the rods forming the main framing.

17,369 of 1902—K. S. DHONDY: *Artificial Stone.*

A process for making artificial stone, consisting in mixing sand and stone treated with sulphuric acid, subjecting the mixture to a bath of farina and caustic potash and water, adding plaster of Paris, and soaking the compound so produced with a solution of ferrous sulphate.

20,550 of 1902.—H. E. KRUSKOFF: *Apparatus for Impregnating Logs or Timber.*

This consists in the combination with apparatus for impregnating logs or timber, of an immersing device adapted to be lowered on to the logs placed in the trough, and to press them below the level of the liquid.

21,225 of 1902.—W. BELL and M. J. ADAMS: *Urinals.*

This relates to the use of a urinal back wherein the complete apparatus may be attached to the wall by bolts or similar fastenings. It further relates to the method of forming a urinal so that the parts may be inserted into each other to cover the joint.

23,558 of 1902.—F. J. A. M. V. VEN and H. DREESSEN: *Production of Artificial Marble.*

This relates to a process of manufacturing artificial marble, the distinctive features of which are that upon the smooth surface of any suitable support or basis to which the material to be used does not stick, a thin coating of cement, plaster of Paris, or other similar material, of either one or several colours, is laid in such a manner that for a varicoloured ground the different colours are in streaks of irregular and slightly overlapping outlines, in longitudinal, transverse, and diagonal directions, upon which coating before it has dried small portions of the same material, but thicker, are thrown in an irregular manner until the whole surface is covered, whereupon this layer is more evenly distributed but without being flattened, this latter being only done after another layer, filling in the unevenness and bringing the plate to a certain thickness, has been put on.

23,663 of 1902. A. J. GASPARY: *Manufacture of Artificial Stones and the like with an Outer Layer or Facing of Coloured or other Material.*

This relates to the production of objects (artificial stones and the like) with coloured or faced edges, by means of a mould with a rising and sinking bottom and a filling-box furnished with special compartments for the reception of the fixing material, in which the slide which closes the opening in the bottom of the filling-box is pulled back after the bottom of the mould has been raised and the latter thereupon slowly lowered, so that the fixing material and stone composition which it covers, sink uniformly into the mould.

24,058 of 1902.—J. A. ORMEROD: *Reducing Valves for Water and other Fluids.*

A reducing valve, consisting of two or more valves, each of differential areas, and fitted in chambers.

24,299 of 1902.—R. LEGGOTT: *Fanlight and like Casement Openers.*

A fanlight or like opener, in which are combined a worm, worm-wheel, and rack, with a pivoted stop, with or without teeth.

MEETINGS.

FRIDAY, JANUARY 23.

Architectural Association.—Mr. J. Dudley Forsyth on "The Attitude of the Young Architect towards the Crafts." 7.30 p.m.

Birmingham Architectural Association.—Mr. A. T. Cooper on "The Application of Electric Light to Buildings."

SATURDAY, JANUARY 24.

The Craft School (137, Globe-road, Bethnal Green, E.)—Mr. E. Cooke on "The Elements of Design," illustrated by the work of the Craft School. 8.30 p.m.

MONDAY, JANUARY 26.

Surveyors' Institution.—Discussion on Mr. H. T. Scoble's paper on "Rural Drainage and Sewage Disposal." 8 p.m.

Royal Philosophical Society of Glasgow (Architectural Section).—Mr. A. Kay, J.P., on "A Prelude on Practical Art Criticism." 8 p.m.

TUESDAY, JANUARY 27.

Royal Victoria Hall, Waterloo-road, S.E.—Dr. Skeats on "The Geological History of a Coral Island." 8.30 p.m.

Institution of Civil Engineers.—(1) Mr. M. Fitzmaurice on "The Nile Reservoir, Assuan." (2) Mr. F. W. Scott Stokes on "Sluices and Lock-gates of the Nile Reservoir, Assuan." 8 p.m.

WEDNESDAY, JANUARY 28.

Architectural Association Discussion Section.—Mr. T. Norman Dinwiddy on "Poor Law Buildings." 7.30 p.m.

Society of Arts.—Mr. Dixon H. Davies on "The Cost of Municipal Trading." 8 p.m.

Edinburgh Architectural Association.—Mr. J. A. T. Houston on "Some Cambridge Colleges," with limelight views. 8 p.m.

Northern Architectural Association.—Mr. R. Hedley on "Sketching in Charcoal." 7.30 p.m.

THURSDAY, JANUARY 29.

Royal Institution.—Dr. A. J. Evans on "Pre-Phœnician Writing in Crete, and its Bearings on the History of the Alphabet."—III. 5 p.m.

London Institution.—Dr. W. Hampson, M.A., on "Liquid Air," with experiments.

Leeds and Yorkshire Architectural Society (Craft Evening and Discussion).—(1) Mr. E. R. Taylor on "Pottery and Tiles"; (2) Mr. W. Gilbert on "Metalwork." 6.30 p.m.

Architectural Association of Ireland.—Technical Demonstration (Timber) at the Works of Messrs. T. & C. Martin, Ltd., North Wall, Dublin. 3.30 p.m.

FRIDAY, JANUARY 30.

Royal Institution.—Professor W. E. Dalby, M.A., on "Vibration Problems in Engineering Science." 9 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. J. R. MacIntosh on "The Design of the Electrical Equipment of a Light Railway." 8 p.m.

SATURDAY, JANUARY 31.

Incorporated Association of Municipal and County Engineers.—Midland District Meeting, Birmingham. Papers on "The Ventilation of Sewers and Drains."

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 13.—By W. A. BLAKEMORE.

Highbury.—9, Northolme-rd., u.t. 86 yrs., g.r. 8*l.* 10*s.*, e.r. 55*l.*	£610

By DAVID BURNETT & CO.

Hammersmith.—Hammersmith-rd., c.g.r., 120*l.*, reversion in 66 yrs.	3,850

By ROGERS, CHAPMAN, & THOMAS.

Battersea.—Creek-st., f.g.r. 21*l.*, reversion in 28 yrs.	740
Pimlico.—36, Cambridge-st., u.t. 37 yrs., g.r. 7*l.*, q.r. 50*l.*	460

January 14.—By ABERCROMBIE & EDMUNDS.

Cricklewood.—Shoot-up-hill, Pakefield, f., p.	2,200

By B. BAILEY & CO.

St. Leonard's-on-Sea, Sussex.—20, St. Saviour's-rd., f., y.r. 38*l.*	600

By PERCY H. CLARKE.

Camberwell.—125 and 127, Coldharbour-ln., f., p.	1,200
Fulham.—18, Moor Park-rd., u.t. 42 yrs., g.r. 7*l.* 5*s.*, y.r. 50*l.*	480

By MAY & ROWDEN.

Spitalfields.—22, 23, and 23½, Wheler-st. (site), area 1,800 ft., f., p.	1,660
Bethnal Green.—Collingwood-st., f.g.r. 63*l.*, reversion in 37 yrs.	1,505

January 15.—By FISHER, STANHOPE, & DRAKE.

Stamford Hill.—13, Amhurst-pk., u.t. 66 yrs., g.r. 14*l.*, e.r. 95*l.*	1,200
Dalston.—100, Sandringham-rd., u.t. 58 yrs., g.r. 7*l.*, y.r. 46*l.*	445

By NEWBON, EDWARDS, & SHEPHARD.

Bethnal Green.—Usk-st., f.g.r. 60*l.*, reversion in 4½ yrs.	1,970
Holloway.—121, Isledon-rd., u.t. 57 yrs., g.r. 7*l.* 15*s.*, e.r. 45*l.*	410
De Beauvoir Town.—107, Culford-rd., u.t. 17½ yrs., g.r. 3*l.* 10*s.*, y.r. 40*l.*	255

By IZARD & IZARD (at Stratford).

Upton Park.—352 and 354, Green-st., (S.), beneficial lease for 10½ yrs., y.r. 110*l.*	320

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. fo public-house; o. for offices; s. for shops.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 14 0	per 1,000 alongside, in river.
Rough Stocks and Grizzles.....	1 11 0	,, ,, ,,
Facing Stocks....	2 12 0	,, ,, ,,
Shippers	2 5 0	,, ,, ,,

PRICES CURRENT (*Continued*).

BRICKS, &c.

	£ s. d.	
Flettons	1 7 6	per 1,000 at railway depôt.
Red Wire Cuts ..	1 12 0	,, ,, ,,
Best Fareham Red	3 12 0	,, ,, ,,
Best Red Pressed Ruabon Facing	5 0 0	,, ,, ,,
Best Blue Pressed Staffordshire ..	4 5 0	,, ,, ,,
Do. Bullnose	4 11 0	,, ,, ,,
Best Stourbridge Fire Bricks	4 8 0	,, ,, ,,
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers.....	13 0 0	,, ,, ,,
Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats.....	17 0 0	,, ,, ,,
Double Stretchers	19 0 0	,, ,, ,,
Double Headers..	16 0 0	,, ,, ,,
One Side and two Ends.....	19 0 0	,, ,, ,,
Two Sides and one End	20 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	20 0 0	,, ,, ,,
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats.....	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers..	14 0 0	,, ,, ,,
One Side and two Ends.....	15 0 0	,, ,, ,,
Two Sides and one End	15 0 0	,, ,, ,,
Splays Chamfered, Squints.....	14 0 0	,, ,, ,,
Second Quality White and Dipped Salt Glazed	2 0 0	,, less than best.
Thames and Pit Sand	7	0 per yard, delivered.
Thames Ballast	6	0 ,, ,,
Best Portland Cement	30	0 per ton, delivered.
Best Ground Blue Lias Lime..	21	0 ,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	10*s.* 6*d.* per yard, delivered.
Stourbridge Fire-clay in sacks	27*s.* 6*d.* per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Bath ,, ...	1 7	,, ,,
Farleigh Down Bath ..	1 8	,, ,,
Beer in blocks	1 6	,, ,,
Grinshill ,, ...	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks..	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 0	,, ,,
Red Mansfield ,,	2 4	,, ,,
YORK STONE—*Robin Hood Quality.*		
Scappled random blocks	2 10	,, ,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. ,,
6 in. Rubbed two sides Ditto, Ditto	2 6	,, ,,
3 in. Sawn two sides slabs (random sizes)..	0 11½	,, ,,
2 in. to 2½ in. Sawn one side slabs (random sizes)	0 7½	,, ,,
1½ in. to 2 in. ditto, ditto	0 6	,, ,,
BEST HARD YORK—		
Scappled random blocks	3 0	per ft. cube ,,
6 in. sawn two sides, landings to sizes (under 40 ft. sup.)	2 8	per ft. super. ,,
6 in. Rubbed two sides Ditto	—	,, ,,
3 in. sawn two sides slabs (random sizes)	1 2	,, ,,
2 in. self-faced random flags.....	0 5	,, ,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.
,, ,, ,, 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
,, ,, ,, 3 in. do.	1 2½	,, ,, deld. rly. depôt.

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	13 2 6	per 1000 of 1200 at ry. dep.
20×12 ,, ,, ,, ..	13 17 6	,, ,,
20×10 best seconds ,,	12 15 0	,, ,,
20×12 ,, ,, ,,	13 10 0	,, ,,
16×8 best ,,	7 0 0	,, ,,
20×10 best blue Portmadoc	12 5 0	,, ,,
16×8 best blue Portmadoc	6 0 0	,, ,,
20×10 best Eureka unfading green....	15 0 0	,, ,,
20×12 ,, ,,	16 10 0	,, ,,
18×10 ,, ,,	11 10 0	,, ,,
16×8 ,, ,,	8 7 6	,, ,,
20×10 permanent green	10 10 0	,, ,,
18×10 ,, ,,	9 0 0	,, ,,
16×8 ,, ,,	6 5 0	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles..	42 0	per 1,000, at rly. depôt.
Hip and valley tiles....	3 7	per doz. ,, ,,
Best Broseley tiles	50 0	per 1,000 ,, ,,
Do. Ornamental Tiles	52 6	,, ,, ,,
Hip and valley tiles....	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles.....	3 0	,, ,, ,,

[*See also page 101.*

COMPETITIONS, CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
Town Hall	Sutton Coldfield Corporation	50*l.*, 30*l.*, 20*l.*	Feb. 20
Town Hall	Chepping Wycombe Corporation	105*l.*, 26*l.* 5*s.*	Mar. 4
*Infectious Diseases Hospital	Chelmsford Joint Hospital Board	25*l.* and 10*l.*	Mar. 31
*Proposed Technical School	Blackpool Corporation	60*l.*, 25*l.*, and 15*l.*	April 14

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Steel Girder Bridge, Baldonie, N.B.	.....	Gordon & Co., Civil Engineers, Inverness	Jan. 26
Wood Fencing, &c., Abbey Park-road	Leicester Corporation	E. G. Mawbey, Civil Engineer, Town Hall, Leicester	Jan. 27
Additions to Schools, Eveswell	Newport (Mon.) School Board	Swalwell, & Creighton, Architects, Dock-street, Newport	do.
Road Works, Quarry-row, Tantobie	Tanfield U.D.C.	R. Heslop, Surveyor, Burnopfield	do.
Road Works, Elwick-road	West Hartlepool Corporation	J. W. Brown, Borough Engineer, West Hartlepool	do.
Street Works, Cardiff-road and Others	Caerphilly U.D.C.	A. O. Harpur, Surveyor, Council Offices, Caerphilly	do.
Tar Pavement, Seaton-road	West Hartlepool Corporation	J. W. Brown, Borough Engineer, Town Hall, West Hartlepool	do.
Hospital Buildings	Grimsby Corporation	H. G. Whyatt, Civil Engineer, Town Hall, Grimsby	do.
Storage Tank and Cast Iron Piping, Guilane, N.B.	Haddington County Council	C. S. Carfrae, Civil Engineer, 1, Erskine-place, Edinburgh	do.
Additions to Holy Trinity Schools, Keighley	.....	Barber, Hopkinson & Co., Architects, Keighley	do
Sewers	Blairgowrie Town Council	Burgh Surveyor, Blairgowrie	Jan. 28
Surveyor's Materials	Sale (Cheshire) U.D.C.	W. Holt, Surveyor, Council Offices, Sale	do.
Street Works, Lansdowne-road, &c.	Birkenhead Corporation	C. Brownridge, Civil Engineer, Town Hall, Birkenhead	do.
House, &c., Blessington	Naas (Ireland) Guardians	D. J. Purcell, Workhouse, Naas, Ireland	do.
House and Shop, Oxford-road, Workington	Mr. C. J. Fox	T. Johnson, Corporation-road, Workington	do.
Broken Granite (9,500 tons), Slag (2,000 tons)	Holland (Lincs.) County Council	H. C. Johnson, Sessions House, Boston, Lincs.	do.
Rebuilding Holborn Bridge	Aston Manor U.D.C.	G. H. Jack, Civil Engineer, Council House, Aston Manor	do.
Sewers, &c.	Audenshaw (Lancs.) U.D.C.	J. P. Wilkinson, Civil Engineer, 47, Arcade-chambers, Manchester	do.
Slating Works at Gasworks	Swadlincote U.D.C.	G. B. Smedley, Civil Engineer, Gasworks, Swadlincote	do.
Three Houses, Shed, &c., Wood Bottom	Marsden (Yorks) U.D.C.	J. E. Lunn, Architect, Milnsbridge	do.
Portland Cement	Gainsborough U.D.C.	R. W. Fraser, Engineer, Council Offices, Gainsborough	do.
Works at the Barbican	Sandwich Town Council	W. J. Jennings, Architect, 4, St. Margaret's-street, Canterbury	do.
Wrought Iron Fencing	Erdington Corporation	H. H. Humphries, Borough Engineer, Town Hall, Erdington	do.
Sewers, &c., Stamford-road and Others	Audenshaw U.D.C.	J. P. Wilkinson, Civil Engineer, St. Mary's Gate, Manchester	do.
Sewerage Works, Ferris	Enniscorthy (Ireland) R.D.C.	J. W. Gardiner, Civil Engineer, Dublin	do.
Three Houses, Dalton, Huddersfield	.....	J. Berry, Architect, 3, Market-place, Huddersfield	do.
Roads, Headstone and New Bessborough Estates, Harrow	.....	Clarke & Charles, Surveyors, Harrow	do.
Sewers, &c.	Wirral R.D.C.	Beloe & Priest, Civil Engineers, 13, Harrington-street, Liverpool	Jan. 29
Street Works, Whalley Range, Lancs.	Withington Corporation	A. H. Mountain, Civil Engineer, Town Hall, West Didsbury	do.
Offices, Gosport-street	Lymington Town Council	The Surveyor, 134, High-street, Lymington	do.
Water Supply Works	Ashby Woulds (Yorks) U.D.C.	J. W. Rowley, Surveyor, High-street, Woodville	do.
Two Shops, Evanstown, near Bridgend	Messrs. Griffiths & Thomas	J. M. Williams, Architect, Blackmill, near Bridgend	do.
Sewers, Barnstown, Storeton, &c., Chester	Wirral R.D.C.	Beloe & Priest, Civil Engineers, 13, Harrington-street, Liverpool	do
Sewer	Harwich Town Council	A. J. H. Ward, Church-street, Harwich	do.
Street Works, Rayleigh Grove	Gateshead Corporation	Borough Engineer, Town Hall, Gateshead	do.
Additions to Infirmary	Newtownards Guardians	J. Colville, Union Offices, Newtownards	do.
*Making-up Woodfield-road	Ealing Town Council	Borough Engineer, Town Hall, Ealing, S.W.	Jan. 30
*New Sorting Office, Liverpool	Commnrs. of H.M. Works, &c.	Office of Works, Storey's Gate, S.W.	do.
Granite and Slag	Hertfordshire County Council	U. A. Smith, County Surveyor, 41, Parliament-street, S.W.	do.
Ten Cottages	Birmingham Corporation	J. Mansergh & Sons, Engineers, 5, Victoria-street, S.W.	do.
School, Rhiwfawr, Upper Cwmtwrch	Llanguicke School Board	D. J. Rees, Architect, Ystalyfera	do.
Broken Granite (6,700 tons)	Spilsby R.D.C.	T. A. Busbridge, Civil Engineer, Spilsby	do.
Road Works, Pontardulais	Swansea R.D.C.	T. T. Williams, Engineer, Alexandra-road, Swansea	do.
Church, Glucknadrummond, Ireland	Committee	J. M. Robinson, Civil Engineer, 7, East Wall, Londonderry	do.
Vestry and Chapel Renovation, Victoria, Wales	Trustees	A. Watkins, 59, Cwm-road, Waen Llwyd	Jan. 31
Granite Road Metal	Sleaford (Lincs.) U.D.C.	E. Clements, Council Offices, Sleaford	do.
Council Chamber, &c.	Bexley U.D.C.	W. T. Hawse, Surveyor, Council Offices, Bexley	do.
Broken Granite	Norfolk County Council	T. H. B. Heslop, Civil Engineer, Shirehouse, Norwich	do.
Road Works, Dorset-road	Littlehampton U.D.C.	H. Howard, Surveyor, Town Offices, Littlehampton	do.
Restoration of Church, Workington	Committee	J. Howes, Architect, 106, Harrington-road, Workington	do
Mess Room and Cart Shed, Green Lane	Manchester Corporation	City Architect, Town Hall, Manchester	do.
Bricks, Cement, &c.	Hemel Hempstead Corporation	W. H. Locke, Borough Surveyor, Town Hall, Hemel Hempstead	do.
Workhouse and Offices	Evesham Guardians	G. H. Hunt, Architect, Evesham	do.
Drainage Works, Aghada	Midleton R.D.C.	J. Stanton, Board Room Workhouse, Midleton	do.
Drill Hall, Aberystwyth	1st Cardigan Roy. Artilry. Vol. Corps.	G. T. Bassett, Architect, Aberystwyth	do.
House, Acacia-road, Hampton, Middlesex	.....	F. G. Hughes, Architect, Marling Park, Hampton-on-Thames	do.
Rebuilding the Cross Inn, Rumney, near Cardiff	.....	E. H. Bruton, Architect, 119, Queen-street, Cardiff	do.
Culvert, Brownsover Bridge Mill	Rugby U.D.C.	D. G. Macdonald, Civil Engineer, High-street, Rugby	do.
Street Works, Dorset-road	Littlehampton U.D.C.	H. Howard, Surveyor, Town Offices, Littlehampton	do.
Restoration of St. John's Church Workington	Committee	J. Howes, Architect, 106, Harrington-road, Workington	do.
Water Mains (13 miles)	East Grinstead R.D.C.	Downes & Co., Civil Engineers, 45, Warwick-road, Redhill	do.
Additions, &c. 2, South-road, Bishop Auckland	.....	W. Perkins, Architect, Victoria-street, Bishop Auckland	do.
*Supply of Map Presses	Ordnance Survey	J. Sansom, Architect, Greenbank-lane, Liskeard	do.
School, &c., St. Germans, Cornwall	.....	Ordnance Survey Office, Southampton	Feb. 2
Road Works, &c., Gardner-road	Prestwich (Lancs) U.D.C.	Surveyor, Chester Bank, Prestwich	do.
Public Offices, Wigan-road	Hindley U.D.C.	Heaton & Co., Architects, Council Offices, Hindley, nr. Huddersfield	do.
Two Shops, High-street, Bromley	.....	F. and W. Stocker, Architects, 90, Queen-street, E.C.	do.
Alterations to Workhouse	Birkenhead Guardians	E. Kirby, Architect, 5, Cook-street, Liverpool	do.
Ironwork, &c., for Marsh Gill Reservoir	Otley (Yorks) U.D.C.	J. Waugh, C.E. Sunbridge Chambers, Bradford	do.
Making-up Wharf-road, Springfield	Chelmsford Corporation	H. G. Warne, Surveyor, Market-road, Chelmsford	do.
Electrical Plant	Batley (Yorks) Corporation	Lacey & Co., Civil Engineers, 78, King-street, Manchester	do.
Footpath, Clifton-road	Prestwich U.D.C.	Surveyor, Chester Bank, Prestwich	do.
Sewers, &c.	Wharfedale (Yorks) R.D.C.	H. A. Johnson, Civil Engineer, 15, The Exchange, Bradford	do.
Schools, New Heath, Derby	Ault Hucknall School Board	Rollinson & Son, Architects, 13, Corporation-street, Chesterfield	Feb. 3
*Footpath Paving Works, Wealdstone	Middlesex County Council	County Engineer, Middlesex Guildhall, S.W.	do.
Portland Cement (6,000 tons)	Leicester Corporation	E. G. Mawbey, Civil Engineer, Town Hall, Leicester	do.
Roads, Sewers, Carlton House Estate, Herne Hill	.....	F. and W. Stocker, Architects, 90, Queen-street, E.C.	Feb. 4
*Making-up of Compton-road	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham	Feb. 3
*Sewers, Wetmore-road	Burton-on-Trent Corporation	G. T. Lynam, Borough Surveyor, Town Hall, Burton-on-Trent	do.
*Supply of Articles (one or three years)	Hornsey U.D.C.	Council's Engineer, Southwood-lane, Highgate, N.	Feb. 9
*Erection of Schools	Ilford School Board	C. J. Dawson, Architect, 7, Bank Buildings, Ilford	do.
*Works of Road Widening	Middlesex County Council	County Engineer, Middlesex Guildhall, Westminster	Feb. 10
*Annual Contracts	County Borough of West Ham	Borough Engineer's Office, Town Hall, Stratford, E.	do.
*Engine Room Stores	do.	Boro' Elec. Engineers Office, Central Elec. Stn., Abbey Mills, West Ham	do.
*New Books	do.	Central Public Library, Romford-road, Stratford, E.	do.
*Meat, Bread, Flour, &c.	do.	Medical Superintendent, Council's Hospital, Western-road, Plaistow	do.
Road Materials, Ormskirk	Lancashire R.D.C.	C. Law-Green, Civil Engineer, Union Offices, Wigan-road, Cruikskirk	Feb. 11
*Unclimbable Iron Fencing, with Gates, &c.	Metropolitan Asylums Board	A. & C. Harston, Architects, 15, Leadenhall-street, E.C.	do.
*Supply of Materials for one year	Lambeth Borough Council	Borough Engineer, Town Hall, Kennington Green, S.E.	Feb. 12
*Generating Station, &c.	Leicester Corporation	Engineer, Town Hall, Leicester	Feb. 13
*School for Girls and Infants	Chiswick School Board	G. Sanderson, Architect, 111, King-street, Hammersmith	No date
Twelve Houses, Twizel, West Pelton	Mr. W. Severs	T. E. Crossling, Architect, Front-street, Stanley	do.
Three Houses, Twizel, West Pelton	Mr. J. T. Robinson	do.	do.
Four Houses, Twizel, West Pelton	Messrs. Smith & Bates	do.	do.
Excavation Works, Trafford Park, Manchester	Cheshire Lines Committee	H. Blundell, Engineer, Central Station, Liverpool	do.
Wesleyan Church, Mapperley, Derby	.....	A. E. Lambert, Architect, 22, Park-row, Nottingham	do.
*Sewerage and Drainage Works	Paddington Borough Council	Borough Surveyor, Town Hall, Paddington W.	do.
Farmhouse, &c., Beamish, near Urpeth	Mr. S. D. Eden	T. E. Crossling, Architect, Front-street, Stanley	do.

[*See also next page.*

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Superintendent of Roads	Fulham Borough Council	150*l.*	Feb. 2
*Surveyor	Eastleigh and Bishopstoke U.D.C.	250*l.*	Feb. 7
*Clerk of Works	Essex County Council	3*l.* 12*s.* 6*d.* per week	No date.

Those marked with an asterisk (*) are advertised in this Number. *Competition*, iv. *Contracts*, iv. vi. viii. x. & xx. *Public Appointments*, xviii.

PRICES CURRENT (*Continued*).

TILES.

	£ s. d.	
Best Red or Mottled Staffordshire Do. (Peakes)	5 1 0	per 1,000 at rly. depôt.
Do. Ornamental Do.	5 4 6	,, ,,
Hip tiles	1	per doz. ,, ,,
Valley tiles	3 8	,, ,, ,,
Best "Rosemary" brand plain tiles	4 8 0	per 1,000 ,, ,,
Do. Ornamental Do.	5 0 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in and 11 in.	15 10 0	16 10 0
Deals: best 3 by 9	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
,, ,, 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 10 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg: First white deals, 3 in. by 11 in.	14 10 0	15 10 0
,, ,, 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 10 0	14 10 0
,, ,, ,, 3 in. by 9 in.	12 10 0	13 10 0
,, ,, ,, battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	33 0 0	upwards.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 6
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
¾ in. do. do.	0 0 6½	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 10 0	20 0 0
American Whitewood Planks— Per ft. cube	0 4 0	- - -

	Per square.	
Prepared Flooring— 1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 1 6
1 in. by 7 in. white, planed and shot	0 11 6	0 13 6
1 in. by 7 in. white, planed and matched	0 12 0	0 14 0
1¼ in. by 7 in. white, planed and matched	0 14 6	0 16 6
¾ in. by 7 inch yellow matched and beaded or V-jointed boards	0 11 0	0 13 6
1 in. by 7 in. do. do.	0 14 0	0 18 0
¾ in. by 7 in. white do.	0 10 0	0 11 6
1 in. by 7 in. do. do.	0 11 6	0 13 6

6-in. at 6d. to 9d. per square less than 7-in.

PRICES CURRENT (*Continued*).

JOISTS, GIRDERS, &c.

	In London, or delivered. £ s. d.	Railway Vans, per ton. £ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders ,, ,,	8 2 6	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 2 6	8 5 6

METALS.

IRON—	Per ton, in London £ s. d.	£ s. d.
Common Bars	7 15 0	8 5 0.
Staffordshire Crown Bars, good merchant quality	8 5 0	8 15 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 10 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes 6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Sheet Iron, Galvanised, flat, best quality:— Ordinary sizes to 20 g.	16 0 0	- - -
,, ,, 22 g. and 24 g.	16 10 0	- - -
,, ,, 26 g.	18 0 0	- - -
Galvanised Corrugated Sheets:— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 0 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 5 0	9 15 0
(Under 3 in. usual trade extras.)		

	Per ton, in London. £ s. d.	£ s. d.
LEAD, &c.		
LEAD—Sheet, English, 3 lbs. & up.	14 0 0	- - -
Pipe in coils	14 10 0	- - -
Soil pipe	16 15 0	- - -
Compo Pipe	16 15 0	- - -
ZINC—Sheet— Vieille Montagne ton	25 0 0	- - -
Silesian	24 15 0	- - -
COPPER— Strong Sheet per lb.	0 0 10	- - -
Thin ,,	0 0 11	- - -
Copper nails ,,	0 0 11	- - -
BRASS— Strong Sheet ,,	0 0 9	- - -
Thin ,,	0 0 10	- - -
TIN—English Ingots ,,	0 1 1½	- - -
SOLDER—Plumbers' ,,	0 0 6½	- - -
Tinmen's ,,	0 0 8½	- - -
Blowpipe ,,	0 0 9½	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.	
,, fourths	2¾d. ,,	,,
21 oz. thirds	3¼d. ,,	,,
,, fourths	2¾d. ,,	,,
26 oz. thirds	4d. ,,	,,
,, fourths	3¾d. ,,	,,
30 oz. thirds	5d. ,,	,,
,, fourths	4½d. ,,	,,
Fluted sheet, 15 oz.	3d. ,,	,,
,, 21 oz.	4d. ,,	,,
⅛ Hartley's Rolled Plate	1¾d. ,,	,,
⅛ ,, ,, ,,	2d. ,,	,,
¼ ,, ,, ,,	2¼d. ,,	,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels	per gallon	0 2 0
,, ,, in drums	,,	0 2 7
Boiled ,, ,, in pipes or barrels	,,	0 2 5
,, ,, in drums	,,	0 2 9
Turpentine, in barrels	,,	0 3 6
,, in drums	,,	0 3 8
Genuine Ground English White Lead	per ton	20 10 0
Red Lead, Dry	,,	20 0 0
Best Linseed Oil Putty	per cwt.	0 8 0
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 6
Superfine Hard-drying Oak, for Seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0

PRICES CURRENT (*Continued*).

VARNISHES, &c.

	Per gallon. £ s. d.
Eggshell Flatting Varnish	0 13 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

CROMER.—For electric light buildings, for the Cromer Urban District Council:—

F. Minter	£3,590 0 0	H. Bullen	£3,147 0 0
R. Chapman	3,410 0 0	S. & F. Smith	3,066 0 0
T. Blyth	3,350 0 0	H. W. Barnes	2,903 0 0
W. Porter	3,329 7 0	G. A. Lines	2,900 0 0
J. W. Neale	3,245 15 6	Girling & Smith, Cromer*	2,885 0 0
Youngs & Son	3,239 8 5		
G. Elsey	3,200 0 0		

DARTFORD.—For making up private streets, Thirza-road, &c., for the Urban District Council. Mr. W. Harston, Surveyor, 8, Hythe-street, Dartford:—

J. Leaver	£1,659 9 0	Parsons & Parsons, Ilford*	£1,313 11 0
A. T. Catley	1,480 0 0		
Free & Sons	1,433 8 3		

LONDON.—For the completion of new casual wards and other buildings at Gainsborough-road, Hackney Wick, for the Guardians of the Hackney Union. Mr. W. A. Finch, architect, 76, Finsbury-pavement, E.C. Quantities by Mr. G. T. G. Wright, 3, Great Winchester-street, E.C.:—

Perry Bros, Bishop's-road, E.* £13,700

For engineering work:—

Fraser & Co., Commercial-road, E.* £3,559

LONDON.—For the erection of dormitories, maternity wards, &c., at the Waterloo-road Workhouse, Cambridge Heath, N.E., for the Guardians of St. Matthew, Bethnal Green. Mr. W. A. Finch, architect, 76, Finsbury-pavement, E.C. Quantities by Mr. C. H. Goode, 22, Buckingham-street, Adelphi, W.C.:—

Patman & Fotheringham	£13,423	Lawrence & Sons	£11,984
Lamplough	13,179	Foster Bros.	11,972
W. Shurmur	12,699	Appleby & Son	11,627
Dearing & Sons	12,599	Smith & Son	11,289
Lawrance & Sons	12,350	Wall & Co.	11,275
Shelbourne & Co.	12,300	A. E. Symes	11,175
Barrett & Power	12,250	J. O. Richardson	10,900
Perry Bros.	12,097	Watts, Johnson, & Co., Limehouse†	10,237
Hayden & Sons	11,985		

King & Son, informal tender.

LONDON.—For extension of boiler-house and provision of two new boilers at the Hackney Union, Homerton, N.E., for the Guardians. Mr. W. A. Finch, architect, 76, Finsbury-pavement, E.C.:—

Watts, Johnson, & Co.	£2,697	Fraser & Co.*	£2,420
W. J. Clark	2,595	W. Shurmur	2,394
H. Lovatt	2,540	Fraser & Fraser	2,237
Barrett & Power	2,480	J. Richmond	2,187

[*See also next page.*

LONDON.—For first portion of scheme (viz., nave, tower, vestries, &c.) of London Baptist Association Church, Mitcham-lane, Streatham, S.W. Messrs. George Baines and R. Palmer Baines, architects, 5, Clement's Inn, Strand, W.C. :—

—	Est. A.	Est. B.	Est. C.	Est. D.	Total.
	£	£ s.	£ s.	£ s.	£ s.
J. Carmichael	4,700	20 0	45 0	81 0	4,846 0
Mattock Bros.	4,687	25 0	41 0	80 0	4,833 0
Johnson & Co.	4,611	19 0	45 0	77 0	4,752 0
Holloway Bros.	3,847	17 0	44 0	77 0	3,985 0
Jenkin & Co.	3,655	24 0	43 0	76 0	3,798 0
Holliday & Greenwood	3,397	17 10	44 0	77 10	3,736 0
T. J. Scott	3,552	19 0	44 0	77 0	3,692 0
Gough & Co.	3,534	17 0	44 0	77 0	3,692 0
Garrett & Son	3,530	23 0	42 0	73 10	3,668 10
Goddard & Sons	3,516	18 10	44 0	77 0	3,656 10
Lorden & Son	3,444	13 0	43 0	75 0	3,575 0
Battley, Sons, & Holness	3,387	17 0	44 0	75 0	3,523 0*

LONDON.—For the reconstruction for electrical traction of the New Cross and Greenwich, &c., section, and small sections in the Borough, of the London County Council Tramways—supply of rails, &c. :—

Bolckow, Vaughan, & Co., Ltd.	£43,548 0 0
Walter Scott, Ltd.	41,483 10 0
Steel, Peech, & Tozer, Ltd.	37,431 19 0
Austin & Co.	36,546 9 0
Witting Brothers, Ltd.	35,512 18 0
P. and W. Maclellan, Ltd., Glasgow*	33,876 19 8
Penney & Co.	33,303 11 0
Edward Lomer	31,679 15 0
Le Bas & Co.	30,060 5 0

LONDON.—For the supply and erection of a 50-ton electric overhead travelling crane at the generating-station to be established at Greenwich, in connexion with the electrical working of the London County Council's tramways :—

Rushworth Bros.	£4,757 5 0
Carrick & Ritchie	4,634 5 0
Jessop & Appleby Bros.	4,020 5 0
Russell & Co., Ltd.	3,999 5 0
Adamson & Co.	3,596 14 6
Chaplin & Co.	3,439 15 0
Booth & Bros., Ltd.	3,412 0 0
Larmuth & Co.	3,313 15 0
Spencer & Co.	2,940 5 0
Broadbent & Sons, Ltd.	2,895 5 0
Marshall, Fleming, & Jack	2,880 5 0
Ransomes & Rapier, Ltd.	2,841 15 0
Higginbottom & Mannock, Ltd.	2,670 5 0
Hitchin & Son	2,174 15 0
C. & A. Musker, Ltd., Liverpool*	2,104 0 0
The United Augsburg and Nürnberg Machine Works	1,994 8 0

[Messrs. Musker will sublet the following portions of the work, namely, (*a*) to Messrs. R. S. Newall & Co., Ltd., the manufacture and supply of the steel ropes for the crane; (*b*) to Messrs. Kynoch, Ltd., Birmingham, or to the Hadfield Steel Foundry Co., Sheffield, the manufacture of the cast-steel; (*c*) to either Messrs. Needham & Sons, Manchester, or to Messrs. Heap & Co., Liverpool, the manufacture of the crane girders; and (*d*) to the British Westinghouse Electric and Manufacturing Co. the manufacture of the motors, controllers, resistances, &c.]

LONDON.—Work at Kentish Town fire-station, to remedy defects in connexion with the heating apparatus and the drying-closet, for the London County Council :—

Werner, Pfleiderer, & Perkins, Ltd.	£186 15 0
Marchant & Hunt	185 0 0
Stevens Bros.	146 0 0
G. & E. Bradley*	140 9 10

LONDON.—Wiring and supply the fittings for electric light and electric bell installations at the Clapham fire-station :—

Wenham & Waters, Ltd.* £323 15

SEVENOAKS.—For the erection of a residence in Hitchen Hatch-lane, for Mr. G. S. Pinchin. Mr. W. A. Finch, architect, 76, Finsbury-pavement, E.C. :—

Patman & Fotheringham	£4,900	Barrett & Power†	£3,875
		T. L. Fearon (withdrawn)	3,438

CORRECTION.—In the list of tenders published last week (page 78) for the erection of a receiving home for children at the Tooting Bec Asylum, the first name should have been "Foster Bros.," not "Foxter & Sons." We printed the list as we received it.

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